# THE TOOL STREET OF THE TOOL STRE

OFFICIAL PUBLICATION OF THE



AMERICAN SOCIETY OF TOOL ENGINEERS

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### Sept., 1917

Vol. XIX

No. 2

### Machine Tools: A Vital War Weapon

MUCH IS SAID and written these days about the necessity of maintaining our armed forces at full strength. And there is almost universal agreement that in these troubled post-atom-bomb days it is imperative that the United States keep its "big stick" ready for immediate and effective use, while speaking "not softly" as Theodore Roosevelt put it-but in such firm tones that no one could interpret our sincere desire for peace as weakness.

Those who warn against "too little, too late" speak of such things as bombing and fighting planes and trained men to man them; and of dreadnaughts and carriers; of paratroopers and artillery when they talk of strength. But they overlook that which makes all the paraphernalia of war possible—namely The Tools.

If strong armed forces are desirable, it follows that supplies must be available for emergency use. And one of the most important factors in this is an advance machine tool supply.

Now, even more than before the late war, the machine tool industry is recognized as the backbone of industrial (which equals war) strength. This will be demonstrated in Chicago. Sept. 17-26. at the first postwar show by the National Machine Tool Builders Association, at which development stimulated by the war and the latest advances in metal working will be displayed.

The Machine Tool Committee of the Army Ordnance Association realizes that machine tools are as much a war weapon as a million man army. The Committee urges that machine tools be kept in an industrial war reserve as insurance against possible future emergencies.

This source says, "The industrial reserve of machine tools is an important national asset. Those of us who tried to buy, beg or rent machine tools during the late 1930's or even in the early 40's will readily agree that a machine tool reserve in being today will effectively eliminate a critical bottleneck in atomic age war production."

The Committee points out that "machine tools are an economical investment in world peace. It is a matter of common knowledge that machine tools become obsolete more slowly than the material produced on them."

An example of this is the little-known fact that lathes used in the American Civil War were used in Ohio plants in war work during the 1940's.

Current War Department policy is to sell or lease machine tools with a string-a security clause-attached. But this policy permits the tools to be scattered in plants throughout the nation—there would be no way of gathering them should a sudden emergency arise.

The Committee makes the point that the industrial reserve of machine tools should be kept under reasonably close control and not scattered. Similarly, leases should be outlawed; the War Department would get only "red tape" when it attempted to re-claim its tools, since lessees in most instances could show good reasons why they need the tools.

Another reason for close control and against scattering is the cost of inspection and record-keeping. Finally, continued use of machine tools in private plants would wear out tools much faster than if kept in

The Committee recommends that machine tools be sold from the industrial reserve only when they are in extremely short supply and then only on condition that the purchaser order similar tools to become Government property when delivered at a future date.

Still another valid suggestion is that machine tools be leased only when reconversion would be aided, and then only for the time required to obtain delivery of new tools.

These changes in policy would aid shortage-hampered industry immeasurably: would save the Government—thus the taxpayers-immense sums; and would assure the War Department that its war potential remained undiminished. Most important of all, they would serve notice on would-be aggressors who, making the same mistake as Hitler and the Japanese in assuming U. S. stands for "Uncle Softy", might attempt to strike suddenly and without warning. Any nation or group of nations contemplating an attack on the U.S. certainly would think twice if they knew the tools were ready to turn out the torrent of weapons that consigned Hitler. Tojo & Co. to the dustpan of oblivion.

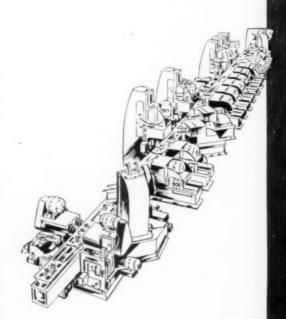
President 1947-48

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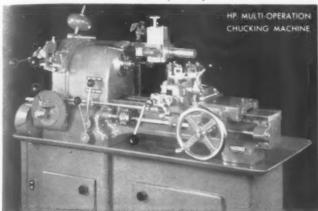
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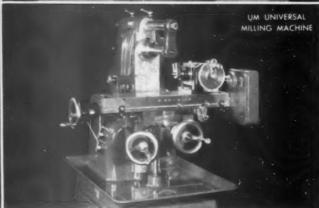
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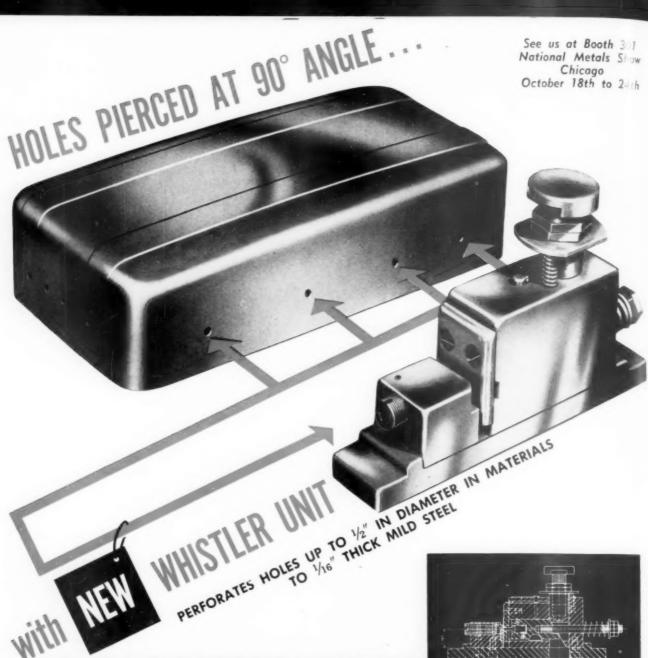


See these machines in operation in Booth No. 45 at the Machine Tool Show September 17-26 at the Dodge-Chicago Plant,

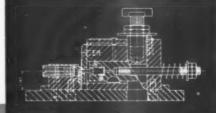
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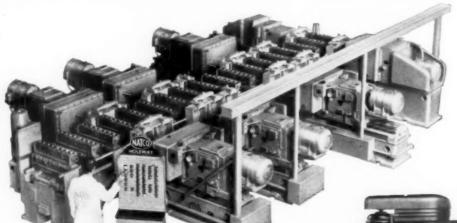
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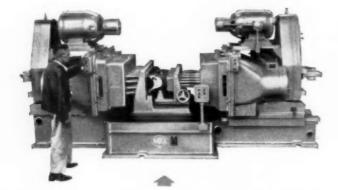
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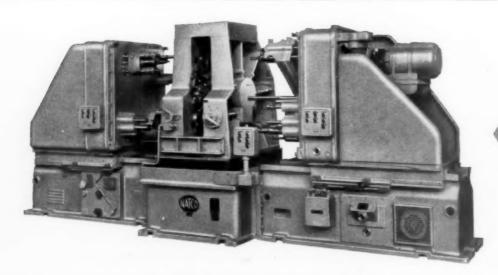


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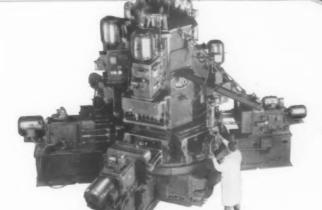


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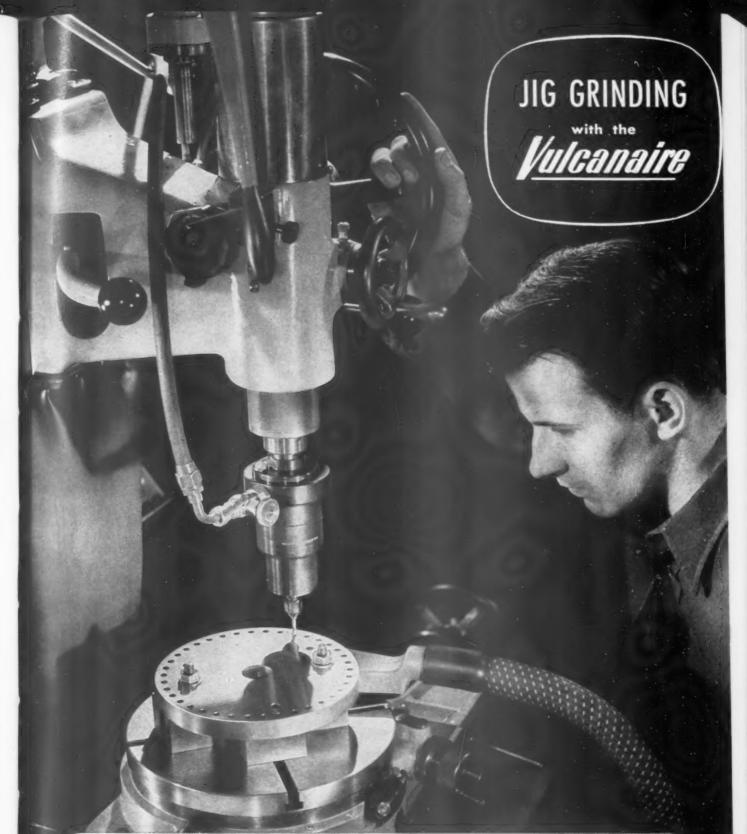
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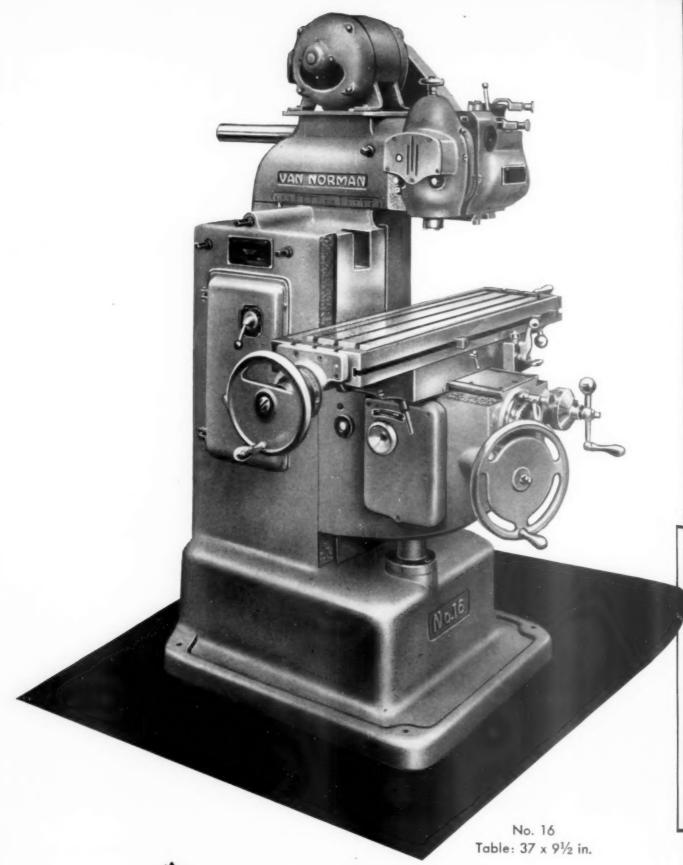


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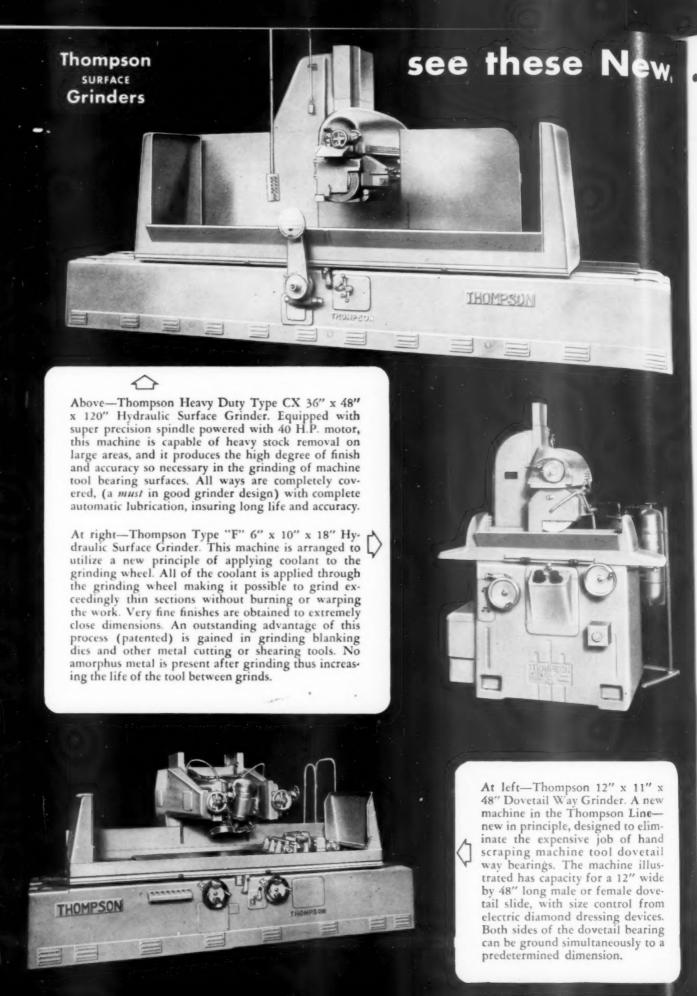
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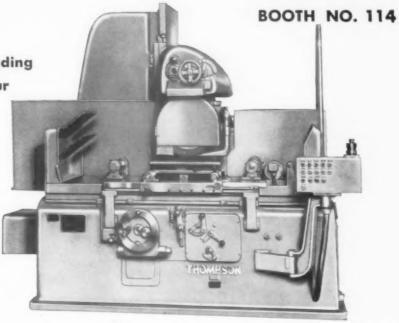
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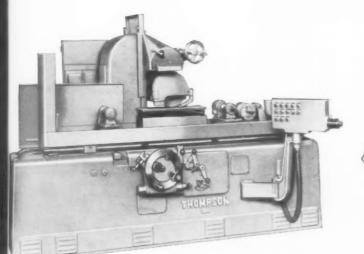
# ... Thompson Machines in operation at the Show

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At left—Thompson Type "B" 12" x 11" x 36" Truforming Grinder. A new design of a popular Truforming (Crushed Wheel Grinding) machine arranged for production grinding of intricate contours, such as flat form tools, serrated milling cutters, tangent type thread chasers and many other precision forms. This machine features automatic wheel crushing, regrinding and reproduction of crushing rolls, and automatic size control.

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# History Says "No!"

In which the Author presents the Facts on a noted Question: Does Production Machinery increase or reduce Employment?

### By Harry E. Conrad

NEMPLOYMENT as a result of the mechanization of industry has been the subject of endless debate, although history has, time and again, offered conclusive evidence in support of the negative. But with each new development in labor-saving tools and machines and concurrent with each period of depression and unemployment, regardless of cause, the affirmative group reopens the debate with new vigor.

The debate began in England in 1770, in which year modern industry may be said to have been born. The symbol was the introduction of Hargreave's spinning jenny—a device in which was incorporated the capacities of eight spinning wheels, enabling one person to do the work that formerly required eight. Spinning machinery was later improved until it was able to turn out several hundred times the production possible with the hand machines. The debate took the form of violence in an effort to prevent the adoption and use of the new machines, and thus force the continuation of the slow, laborious production of cloth by hand weaving.

HARRY E. CONRAD, Executive Secretary of the American Society of Tool Engineers, needs no introduction to our readers. In this article, which appeared originally in May 1947 Modern Machine Shop, he draws on American industrial history to settle, for all time, a widely debated question.

Twenty years later the foundation was laid for the extension of modern industry to this country when 22-year-old Samuel Slater built the first American Arkwright-type cotton spinning machine and established his claim to the title of "Father of American Manufacturing." Slater's Rhode Island factory, employing 14 persons, was the beginning; today America has thousands of manufacturing plants throughout the country, offering employment to approximately 14,000,000 men and women. And although America's productive ability has raised its living standards to the highest of any nation on Earth; although this same productive ability enabled us to win the greatest war of all time the debate continues.

Slater's spinning machine was put into operation in 1790; in the years that followed, American mechanics, engineers, inventors and scientists set the stage for the rapid expansion of industry, not only by means of the new machines that they developed for performing all manner of tasks, but also through the development of tools by which the machines could be produced in the quantities and to the qualities necessary to large-scale manufacturing operations.

Among the inventors was Eli Whitney, best known as the inventor of the cotton gin, who advanced the principle of interchangeable parts and applied it to the manufacture of firearms. He also developed the milling machine and established techniques for the design and manufacture of jigs, fixtures and gages; thus he can rightfully be called America's first Tool Engineer.

Without the benefits of labor-saving machines and those jigs, fixtures and gages, America would still be in the "dark ages" industrially; the manufacturing costs of automobiles, typewriters, mechanical washing machines and other living accessories would be so high as to put them beyond the reach of the masses, yet the debate has arisen again and again—upon occasion so forcibly as to result in violence on the part of those who feared that labor-saving machines would deprive them of their means of livelihood or otherwise introduce unwelcome changes in their ways of life.

Parisian quill penmen rioted when printing machines were first introduced; English textile workers destroyed the machines when the first spinning and weaving mills were put into operation; Philadelphians held public demonstrations to express their opposition to steam locomotives and railways.

It is true that in many cases the fears of the workmen as individuals were valid. The introduction of labor-saving machinery has in many cases caused at least temporary unemployment and in some cases has been the cause of severe individual hardships—hardships which must be chalked up as a part of the price the world must pay for progress. But in the long run society has benefited immeasurably, and in most cases those same workers were absorbed into the better jobs thus created.

### **Inventions Create Employment**

The carriage manufacturing business was practically ruined by the development of the automobile, yet for every person who owned a horse and carriage 50 years ago, hundreds now own automobiles and for every carriage-maker who was thrown out of a job, hundreds are now employed in the automobile factories, parts factories, and service stations. The development of textile spinning and weaving machines released many hand spinners and weavers from their jobs, but the reduction in the cost of textiles, due to the machines, brought about an increase in sales to such an extent that the number of workers in the textile mills was trebled while the population was doubling. The invention of the typesetting machine temporarily displaced many hand typesetters, yet the number of persons employed in the printing trades is more than three times as many as were employed 50 years ago.

That story is the story of every industry in which laborsaving machinery is developed. The machine multiplies production, manufacturing costs go down, sales multiply due to the reduced costs, and employment is multiplied as a result of the increased demand. In addition a vast amount of drudgery is eliminated, wages are increased, and more goods, conveniences and accessories are made available to the public at large—all of which contributes to a higher standard of living.

A comparison of population trends with the number of men and women gainfully employed shows that in the period from 1870 to 1930—the 60 years in which machinery and technological improvements were introduced most rapidly—the increase in number of workers in America was much greater than the percentage of gain in total population. From a total of 39,818,000 in 1870, the country grew to

<sup>\*</sup>Reprinted from May 1947 Modern Machine Shop.

122,775,000 in 1930—an increase of 218 per cent. In that same period the percentage of population gainfully employed rose from 32.4 to 39.8. Today 422 out of every 1,000 persons

are employed at regular jobs.

This increase has been accompanied by a marked shift of labor from one group of occupations to another. As machines have so increased the productivity per worker in certain industries as to curtail greatly the labor force required, other machines have made possible the creation of new types of manufacturing which have not only absorbed the displaced workers from the previously mechanized industries, but have provided jobs for additional numbers of the employable population.

### From Agriculture to Manufacture

Beginning shortly after the Civil War, this shift in employment was most noticeable in the trend of workers away from agricultural pursuits and into the mechanical and manufacturing industries. In the period between 1870 and 1930, during which the number of gainfully employed showed a much greater percentage of increase than the total population, there was great movement from one general classification to another.

In 1870 approximately 7,000,000 of 12,297,000 employed were engaged in agriculture, while in 1930 only 10,772,000, or approximately one-fifth of the total workers, were found on farms. The mechanical and manufacturing industries claimed about one-fifth of the workmen of the '70s, but in 1930 accounted for the employment of nearly 30 per cent of the country's 48,830,000 workers. At the same time employment in the groups which grew up in support of, or as a result of, the expansion of manufacturing gained rapidly. In transportation and trade the increase was almost three-fold, rising from approximately 10 per cent in 1870 to more than 28 per cent in 1930.

More specifically, a check of employment by occupations during the period of 1920-30 reveals that 19 expanding fields of work provided employment for three new workers for each one that was lost from a similar group of shrinking industries. The decreasing occupations, characterized by high-cost hand processes, lost 807,000 workers while 2,264,548 were being added to the payrolls of the expanding groups.

Jobs developed for 687,000 new truck drivers and chauffeurs and 356,512 new mechanics while 309,000 teamsters and draymen and 12,319 stable hands were being dropped from the payrolls. While no one is likely to contend that the conversion was direct, and while probably very few of the teamsters actually became truck drivers, it is apparent from these figures that during this period the machine provided almost three jobs for each one that is eliminated.

Today, according to listings of the United States Employment Service, there are some 20,000 occupations common to business, industry and the professions. Many of these occupations not only were unknown in 1870, but were impossible. The occupations designated have assumed important positions in our national economy only because men of inventive genius and mechanical skill were able to create machines with which other men could produce—at great savings in labor and costs—conveniences and accessories for the masses. We had to learn to build trucks efficiently and economically before truck driving could become the occupation of 972,000 Americans.

The new occupations have provided opportunities for the employment of increasing numbers of women workers, and this increase in feminine employment has been an important factor in the general gain in the percentage of the population holding jobs. The largest group of women workers is found in distribution and service occupations, many having shifted to these jobs in recent years from the manufacturing and mechanical trades. This fact is evidenced by the drop in the proportion of employed women found in industry; from 26 per cent in 1890 to 18 per cent in 1930.

As evidence of the gain in other types of occupation have the fact that in 1930, as compared to 1890, there 38 times as many hairdressers and manicurists, 37 time many stenographers and typists, 31 times as many telepland telegraph operators, 18 times as many people in literand scientific positions, 17 times as many bookkeepers accountants, and 14 times as many clerks and copyists.

It is not only among feminine workers that employmen in service and distributive occupations has advanced. Fact by jobs resulting from mechanization of industry comprise and a fraction of the total number developed in the wake of technological advancement. The machines have to be fed now materials and their products have to be made available to consumers. The efforts of many men doing many types of work are needed to supply the raw materials.

Varied channels, staffed by personnel of diverse skills and talents, are required to guide the flow of goods from the Inctories, through the wholesale and retail markets and into use. In 1939 there were 646,028 service-type business establishments in operation in the United States—most of which exist wholly or partially, directly or indirectly as a result of technological progress. In that year they offered jobs to an average of 1,102,047 persons and maintained a payroll of \$1,069,877,000.

Although large in size and tending to grow monotonous in reading, figures such as those quoted above form the base for the pyramid of evidence which history has compiled throughout the years to support the affirmation that the machine is the world's most important creator of employment. America's ability to invent, develop, manufacture and use machinery has made her the leader among the nations. Counted by the hundreds are the new industries that have had their beginnings in this country.

### More Machines-More Employment

No story of this expansion of opportunity can be complete without a chapter on the automotive industry and the jobs it has created. In 1899 this new industry produced 3,700 automobiles and trucks and employed 2,200 persons. Just 33 years later 447,000 workers turned out 4,360,000 passenger automobiles and 820,000 commercial vehicles, and by 1937, the year of peak employment in the industry, 517,000 people were employed in the automobile factories. In the period between 1899 and 1927 the number of man-years required for the production of one car or truck dropped from sixtenths to less than one-tenth. At the same time the number of men and women on the industry's payroll increased more than 200 times!

By 1937 a group of 15 industries, wholly developed since 1870, gave direct employment to approximately one-sixth of our manufacturing population. More than half a million, or about one-third of the 1,529,100 in this group, were directly engaged in the manufacture of automobiles and parts. The gasoline and oil industry accounted for 100,500 jobs and about 90 per cent of their products were used by the motor industry. Another 75,600 were manufacturing rubber tires and inner tubes—all for automobiles and trucks. These are but a few of the millions of jobs created directly or indirectly by this one invention—and the machines which made its production possible.

In 1937 this one industry required the products of 80 per cent of the rubber industry, 73 per cent of all plate glass produced, 60 per cent of the alloy steel, 40 per cent of all mohair, 31 per cent of the lead products. In addition, the markets for other products, such as steel in all forms, cotton, and various metals, have been greatly expanded by the rise of the automotive industry.

Services, the demand for which was created directly by the automotive industry, accounted for 91,875 full and parttime jobs in establishments such as general repair shops, brake repair, laundries, paint shops, radiator shops, rental s cices, storage garages, top and body repair, battery and tion repair, tire, wheel, axle and spring repair and park-

other businesses whose growth can be at least partially redited to the wide use of automobiles include such varied erprises as insurance companies, highway restaurants. rist camps and resort hotels. To these may be added aner highly important field-that of highway construction! The creation of jobs by the automobile manufacturing instry is the outstanding example in a field which was highly chanized, comparatively speaking, from the beginning. any of the industries which today are highly mechanized we become so only recently, having once been largely handperated. In many of these industries we find that although he introduction of machinery reduced drastically the mount of labor required per unit of production, it made possible such rapid expansion that in a short time more workers were needed than previously. For example, in the givon industry almost incredible reductions were made in the employment per unit of production between 1929 and 1937 as a result of the development of certain labor-saving machines, yet during that same period the volume of employment increased more than 40 per cent.

### **Machines Improve Quality**

In some cases the introduction of a new machine or a new technological process or technique has very directly created new employment by increasing the amount of labor required per production unit. For example, this situation occurred in the steel industry in 1926 with the introduction of the continuous cold process of strip rolling. By making possible creation of many new types of product, the adoption of the new process resulted in an increase in employment per ton of finished product. Employment showed a 26 per cent gain between 1927 and 1937, despite the fact that this period included the depression years.

It is interesting to note that the introduction of mechanical refrigeration has actually accelerated the ice business to the extent of doubling the number of ice dealers between 1920 and 1930. The place of perishable foodstuffs in the American diet became so important, once a mechanical means of keeping them fresh in the home was introduced, that the people who could not afford or did not wish to buy electric or gas refrigerators increased greatly their purchases of ice.

Industries such as those engaged in the manufacture of radios, phonographs, business machines and cash registers all showed employment gains during the depression. During those bare years the infant and fast-growing aircraft manufacturing industry employed more than seven times as many men as it did in 1923-25.

All too often in the debate of the effect of machinery on employment is one extremely important point overlooked—an analysis of the motives underlying the introduction of machinery. Too often it is forgotten that only a comparatively small proportion of new machines are installed for the sole purpose of saving labor. One authority on the influence of inventions on civilization—S. C. Gilfillan—has estimated that less than one out of three have been predominantly labor saving. Thus we see that the greatest direct effect of machinery lies in the creation of new goods and services and the more efficient production and increased quality of existing products.

Although, as is illustrated above, there is ample evidence of direct creation of new jobs to prove that machinery has been a tremendous asset to our growing country, we cannot overlook the other advantages for which it has been responsible; advantages which, added together, have made it possible for the United States to attain the highest standard of living the world has ever known. While the citizens of the United States make up only 17 per cent of the world's population they drive 80 per cent of the world's automobiles, use

60 per cent of the world's telephone and telegraph facilities, own 50 per cent of the world's radios and operate 33 per cent of the world's railroads—all products of the machine.

#### Luxuries Then-Necessities Now

This generation has the advantage of many conveniences which we consider essential to comfortable living, but which once were luxuries to our fathers and mothers and were quite unknown to our grandparents. Widespread ownership of these new things—many of which are in themselves machines—among all classes of people has been made possible by the increased production and consequent reduction in unit cost resulting from the mechanization of industry.

In the peak year of peace-time production—1929—the volume of goods manufactured was three times that of 1899. Inasmuch as during the same period the population increased only 62 per cent, it is evident that there was a 95 per cent gain in per capita consumption. This merchandise was available to the general public at a price which was within their reach only because the high production capacity of the machine made possible a low unit cost.

There is practically no limit to the number of examples that can be cited to illustrate the point that prices of certain kinds of goods have been brought within popular reach because of the increased production due to the machine. If the prewar Ford had been manufactured without the advantage of mass production methods, each car would have cost the buyer \$17,850—and only about 50 Americans could have been considered as prospective purchasers each year. A half century of technological improvements in aluminum manufacturing slashed the price to one-fortieth of the original figure and made possible the distribution of aluminum products to every household in the land.

Due to the perfection of machines for the manufacture of rayon, the production of rayon multiplied ten fold within a few years and prices to the public were reduced by 90 per cent. And it should not be overlooked that the increases in production and reductions in price were accompanied by phenomenal advances in quality.

Manufacturers of automobile tires point out that while today's tires give ten times as much service as did the tires of 30 years ago, the prices of tires have been reduced by three-fourths. In 1914 not even the most accomplished bulb-snatcher could keep one room well lighted as gauged by today's standards. The light bulbs of only a few years ago burned out so quickly that instead of today's handy carton of six, they were sold in standard packages of not less than 50, and a 60-watt bulb sold for 43 cents.

Anyone who drove an automobile in 1914 can spend endless hours recounting the now-amusing incidents resulting from the car's low standard of performance. Yet, assuming that the story teller owned an average automobile, we find he paid at least \$1,115 for it. According to figures prepared by the Automobile Manufacturers' Association the passenger car he bought in 1938 cost \$783—and today it's still a pretty valuable piece of property. To run well for nine years it had to be well made in the beginning.

#### Increased Wages—Shortened Hours

As the points pile up on the side of the machine and its influence on our living standards, we come to other extremely important factors that can be credited to the "machine age." Probably the most important of these are increased wages and shortened working hours. Beween 1899 and 1929 there was a decline in weekly hours of work of 14.8 per cent—and during that same time the output per worker increased 68 per cent.

In 1914 the average factory wage in 25 major manufacturing industries was about 25 cents per hour. By 1938 it had almost tripled, reaching 71.3 cents. In 1919 the average weekly earnings of workers in manufacturing was \$23.29 for a 47.8 hour week; 10 years later the workers were paid \$26.40

for 45.7 hours, and in the first six months of 1946 the pay for a 40-hour week averaged considerably more than a dollar per hour. In spite of the decline in production, wage rates continued to increase throughout the depression, reaching a new high each year. If a factory worker had been the purchaser of that 1914 automobile referred to above, it would have cost him 4,514 hours of work. The 1938 model would have cost 1.098 hours.

All of these effects of mechanization have added up to greatly increased purchasing power. When living costs and wages are compared we see that the average worker in the United States can buy nearly twice as much as an English worker, three times as much as a German and four times as much as the Italian, but only one-third more than the worker in Sweden where the mechanization of industry is comparable to that of the United States.

Between 1914 and 1938, a period including both the booming '20s and the depression years, the average weekly increase in the pay of factory workers rose 105 per cent while the cost of living increased 40 per cent. In 1938 he could buy 20 of the most widely used products, such as clothing and house furnishings, with only 30 per cent of the hours of work that would have been required in 1914.

Thus we see that the mechanization of American industry has not only created many more jobs than it has rendered obsolete, but has snortened hours, increased wages, and brought to the average American citizen desirable new goods and services at prices which raise his living standards are above those of workmen in other countries.

But in spite of these facts the debate continues just as it has for nearly 175 years—and arguments on either sale

haven't changed much during that time.

Since 1870 so many discoveries have been made by science, so many machines and tools to eliminate hard labor and increase production have been developed by American engineers, and so many new commodities have been made available to the American public that people now accept them as a part of a never-ending flow stemming from Yankee ingenuity for the purpose of making life more comfortable. Each new discovery uncovers dozens of new possibilities, Millions of dollars are now spent yearly for research by industry, government and academic institutions. Within this research lies the key to tremendous technological advances in the future.

As these improvements become, in turn, part and parcel of our national life, they will give rise anew to the old familiar question "Does the mechanization of industry cause unemployment?"

And just as it was yesterday, just as it is today, the best answer tomorrow will be "History Says No!"

### Latrobe Electric Announces Higher Impact Strength Die Steels

The manufacture of Desegatized brands of dispersed segregate die steels claimed to possess an exceptionally high impact strength, has been begun by Latrobe Electric Steel Company, Latrobe, Pa., with the production of four high carbon, high chrome grades. The new line, which should be of considerable interest to die makers, marks the successful application to die steels of Latrobe's process for manufacturing dispersed segregate steels, first introduced in high speed tool metals in 1945.

Grades manufactured are Select B, modified chrome air hardening; G.S.N., high carbon, high chrome oil hardening; Olympic, high carbon, high chrome air hardening; and Cobalt Chrome, special high carbon high chrome cobalt air hardening.

In the new die steels, an even dispersion of free carbides is achieved in the body of the steel, thus eliminating grouping together of carbides in a brittle central mass. This quality is claimed to give a more uniform bar, substantially lessened warpage and breaking, and more consistent results under heat treating.

An unusually high impact strength has been established in exhaustive testing, as indicated by the following com-

Unretouched photomicrographs of center sections of 4" rounds cut from bars of standard (left) and of Desegatized brand (right) Olympic die steel. Magnified 250 times, grouping of carbides in a central mass in the standard sample, and their more even dispersion in the dispersed segregate bar, are clearly shown. Samples were hardened, tempered, polished and etched to bring out carbide structure clearly.

parative impact values of samples heated to the most effective usable hardness for maximum working efficiency:

Die Steels	Hardness Rockwell C		d Old Process Impact Strength foot-pounds
Select B	62.0	69.5	50.0
G.S.N.	59.5	25.0	22.0
Olympic	60.0	70.0	61.0
Cobalt Chrome	60.0	55.0	44.0

### **Tensile Strength Computer**

ORDINARILY, in the physical testing of materials, engineers are required to make calculations for each type and size of specimen. To cut this time, engineers at W. C. Dillon & Company, Inc., makers of testing equipment, computed a lengthy chart comprising numerous pages. Now, however, they have devised a hand size Computer, shown, with all this data at fingertip view.

Set the Computer at specimen size then read the breaking strength opposite the psi. Area, or psi., can be found almost instantly. With this tool, an engineer can ascertain psi., or how big to make a specimen, or what load he will need. Knowing the two factors, the third is a ready answer.

The Computer is not offered for sale, but may be had without cost by engineers submitting their full name, company and position. Professors in high school and college may also obtain the Computer by writing the Company at 5410 W. Harrison Street, Chicago 44, Ill.



### Previews of the Machine Tool Show

Showing Part of A Galaxy of Tools Designed to Produce "More Goods for More People at Lower Cost".

LL ROADS WILL LEAD TO CHICAGO September 17th when the doors of the huge Dodge-Chicago Plant now the Tucker Corp'n Plant) open for the 1947 Machine Tool Show, sponsored by the National Machine Tool Ruilders' Association, of which Herbert E. Pease, President the New Britain Machine Company, is the incumbent

The theme of the Show, according to Mr. Pease, is "More Goods for More People at Lower Cost," and the men who make the goods for this nation's consumers and, to a considerable extent, for the consumers of the entire world, know that this is no idle slogan. The machine tools that will be shown in Chicago are truly the master tools of industry, designed to produce more and better things for

more people and at lower costs.

That the Dodge-Chicago (or Tucker) plant should have been chosen as the locale for the Show was a "natural" considering that nowhere else in America is there sufficient floor space to stage this huge exhibit, which will include about two thousand new machine tools and other metal working equipment—a total of twelve acres of floor space. Some \$16,000,000 worth of the latest in cost-cutting toolsthe product of close to three hundred leading manufacturers-will be on display from the 17th through the 26th. Hours will be from 9 A.M. to 5 P.M., Sunday excepted.

Many of the tools displayed at the Show-the first of its kind, by the way, in twelve years-will be entirely new in design. Others will be long-tested machines with entirely new attachments and applications. The exhibits will run the gamut from heavy forging equipment and production machinery to exquisitely delicate instruments for automatic gaging and control of quality.

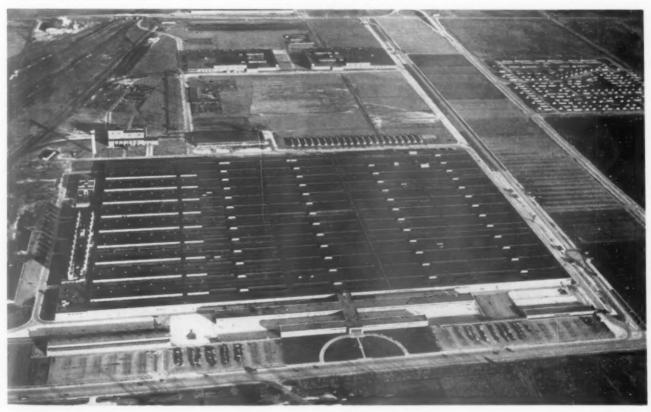
Concurrently with the show will be held the Machine Tool Congress, of which K. H. Hobbie, President of the Chicago Technical Societies Council, is president. Nine important associations will participate in arranging the program of speakers at the meetings, which will be open to registered visitors at the Machine Tool Show. These include American Bolt, Nut and Rivet Manufacturers' Ass'n; American Foundrymen's Ass'n; American Machine Tool Distributors' Ass'n; American Society of Mechanical Engineers; American Society of Tool Engineers; Chicago Technical Societies Council; National Electrical Manufacturers' Ass'n; Society of Automotive Engineers; and the National Machine Tool Builders' Association.

Good Fellowship to Prevail

A formal dinner of welcome, to visiting executives from overseas, will be held in the ballroom of the Palmer House on the evening of Tuesday, September 23, with Charles J. Stilwell, President of Warner & Swasey Company, toastmaster. Speakers of international importance will represent government and industry,

Scheduled meetings, at which black teen business suit is optional, are as follows:

The gigantic Dodge-Chicago plant (now being used by The Tucker Corporation), which will house the 1947 Machine Tool Show from September 17 through 26. The Show is expected to draw an attendance of 100,000 top executives of the metal-working industry from all industrial nations.



Wed., Sept. 17 American Machine Tool Distributors' Ass'n. Hotel LaSalle Thurs., Sept. 18

American Society of Mechanical Engineers. Hetel Continental.

American Society of Tool Engineers and American F.i., Sept. 19 Foundrymen's Association. Old Town Room, Sherman Hotel.

Mon., Sept. 22 National Electrical Manufacturers' Ass'n. Palmer House.

Chicago Technical Societies Council. Tues., Sept. 23 Hotel Knickerbocker.

Wed., Sept. 24 American Society of Mechanical Engineers. Civic Opera Bldg.

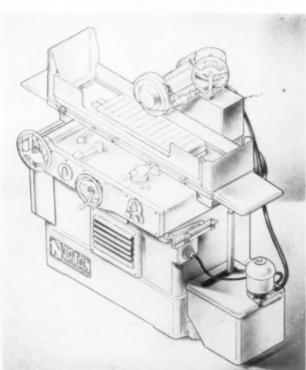
Thurs, Sept. 25 Society of Automotive Engineers. Hetel Continental.

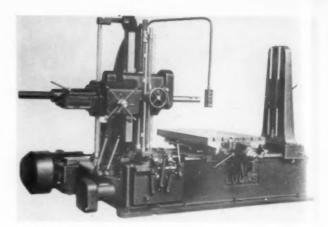
Assignment of space in the show has been under charge of the Show Committee headed by Swan E. Bergstrom, Sales Manager, The Cincinnati Milling Machine Company. Serving with Mr. Bergstrom on the Committee are: William L. Dolle, President, The Lodge & Shipley Machine Tool Co.; R. W. Glasner, President, Clearing Machine Corporation; Helge G. Hoglund, Vice President, Van Norman Company; Ralph J. Kraut, President, Giddings & Lewis Machine Tool Co.; Donald M. Pattison, Vice President, The Warner & Swasey Company; and Louis Polk, President, The Sheffield Corporation.

The Chicago Committee includes Rudolph W. Glasner, President, Clearing Machine Corporation, Chairman; George Habicht, President, Marshall & Huschart Machinery Co., Vice Chairman; Edward K. Welles, President, Charles H. Besly and Company; A. G. Bryant, Vice President, Cleereman Machine Tool Co.; Harold B. Smith, President, Illinois Tool Works; Norton A. Booz, President, Federal Machinery Sales Co.; M. J. Wiora, Vice President, Bryant Machinery & Engineering Co.; and E. Porter Essley, Vice President, E. L. Essley Machinery Co.

On the Registration Committee are: Helge G. Hoglund, Vice President, Van Norman Company, Chairman; T. B. Buell, Sales Manager, Sundstrand Machine Tool Co.; Kirke W. Connor, President, Micromatic Hone Corp.; E. Blakeney Gleason, Vice President, Gleason Works; Frank Moran, Vice President and Sales Manager, The Carlton Machine Tool

The Norton, 8" x 24" Surface Grinder, by Norton Company, Worcester, Mass.





Lucas "41", 3" Spindle Horizontal Boring, Milling, and Drilling Machine, by Lucas Machine Tool Co.

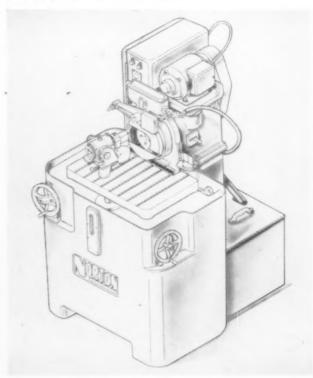
Co.; and Robert R. Rhodehamel, General Sales Manager, The National Acme Co.

In view of the tremendous work involved in preparing for the Show, one cannot possibly give adequate credit to the officers of the N.M.T.B.A., or to the Committees and their heads who have worked to make it an outstanding success. The caliber of these men-all of them ranking industrial executives, among whom Herbert H. Pease, Swan Berkstrom, Wm. Dolle, Helge Hoglund, Ralph Kraut, Louis Polk, Frank Moran and Rob't Rhodehamel are prominent in ASTE work-is in itself assurance of a thorough groundwork and a sound Show structure.

To describe an undertaking so vast, in detail, would entail a work encyclopedic in scope and involving weary months of preparation. We are not prepared for such an undertaking, nor would it serve any useful purpose. Especially so since, even at date of going to press, many of the exhibitors are still working on their displays and details have not been released for preview.

Neither are we prepared to go into complete technical details and specifications of the many machines listed in this writing. All that may be had from exhibitors' literature.

The Norton No. 2 Bura-Way Tool Grinder. Booth No. 5.





parcal installation of Centerless Lapping Machines, by Size Control Co. Machines as shown working on precision office equipment.

while any additional information may be had from company representatives who have all the know-how. Under the groumstances, we will confine ourselves to introducing this equipment in "Preview" and to showing what the tools will do rather than to how they do it.

Unfortunately, even the best verbal and pictorial descriptions can but inadequately portray this gamut of equipment, all of which is outstanding and warrants the closest scrutiny of cost-conscious manufacturing executives. After all, there is only one way to get the full benefit of this Show, and that is to attend it.

SIZE CONTROL COMPANY, Division of American Gage & Machine Company, 2500 Washington Blvd., Chicago, will exhibit a comprehensive line of advanced gages, in addition to the recently developed Centerless Lapping Machines which give a precision finish of less than 2 microinches to cylindrical parts. A specialist in lapping operations will be present to answer questions, and visitors will be able to satisfy themselves that all claims made for these machines are entirely valid.

The company, which will exhibit in Booth No. 401, has arranged to conduct daily tours to its gage manufacturing Crossed-Axis Gear Finisher, by Michigan Tool Co., Detroit



plant, and also to the plant of its affiliate division—Walsh Press & Die Co.—where Walsh Punch Presses are manufactured.

MICHIGAN TOOL COMPANY, Detroit, will have what amounts to an entire gear department in operation in its exhibit, which will take in Booths No. 426, 427, 470, and 471.

The plan is to bring into the exhibit a quantity of clustergear blanks on which one 22-tooth gear has already been hobbed, while a second—an 18-tooth shoulder gear—still has to be cut. The latter will then have all its 18 teeth cut simultaneously on the extremely high speed new Michigan "Shear-Speed" gear cutting machine.

From there, the cluster will go to two different types of gear finishing machines. The 22-tooth gear will be finished on a Michigan rack type Shaver, while the 18-tooth shoulder gear is to be finished on an entirely new type of underpass Rotary Gear Finisher, to be "unveiled" at the Show. Completing the set-up will be a Sine-Line Involute Checker with a recorder coupled to it, permitting the making of involute checks on the finished gears.

The improved rack type Gear Finisher, which permits the simultaneous finishing of two or more gears in tandem, is designed to nearly double the already high productive output per hour of this type of gear finisher. Hydraulic in operation, the machine has a duplex head and tailstock, permitting one gear to be mounted between centers and another on a stub arbor immediately ahead of the centers. Hydraulic clamping interlocks with the machine operation so that the machine cannot be started until the gears have been mounted. Cycling is completely automatic.

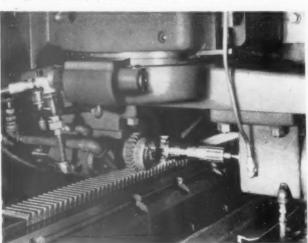
The Cone-Drive Division of Michigan Tool Co., Detroit, also exhibiting in Booths 426, 427, 470 and 471, with a new line of Fan-Cooled, Cone-Drive Speed Reducers which eliminate the necessity for taking thermal ratings into consideration when selecting such drives. The maximum mechanical horsepower ratings of these Cone-Drive Reducers, which of course are extremely high due to the larger load carrying capacity of these gears, is the only rating which need be considered.

Tool Steels and Carbides will highlight the display of ALLEGHENY LUDLUM STEEL CORPORATION, Booth No. 645, near the main entrance of the hall.

Plans include a conference space at the display where customers can actually watch the designing of carbide die sections by A-L tool designers and discuss with them the properties of the wide range of Allegheny Metals.

In addition to tool steels and carbides, stainless and electrical steels will be displayed, and the company's library of technical literature will be available to customers at the Show.

Rack Type Gear Finisher, by Michigan Tool Co.





H & G Threading Machine, by Eastern Machine Screw Corp'n.

EASTERN MACHINE SCREW CORPORATION, New Haven, Ct., will exhibit (Booth No. 160) the well known H & G line of threading machines and die heads, including several items never previously exhibited. Also exhibited will be the H & G Chaser Grinders, which will be in operation to demonstrate the correct method of grinding chasers. A corps of factory-trained engineers will be on hand to answer any questions regarding H & G equipment and also to help solve any screw cutting problems that may be presented. In this connection, the company has developed some very ingenious tools for threading on close centers and at production rates that would be practically impossible by less advanced methods.

HARDINGE BROTHERS, INC., Elmira, N. Y., have prepared their exhibit with meticulous care, as shown by the interesting 3-dimensional "plant layout" in the photograph. The exhibit will be grouped into two categories, so as to simplify coverage by the visitors and thus save valuable time. Thus, the left section (Exhibit No. 45) will contain equipment for Production Departments, while the right section will be devoted to Tool Room equipment.

In the Production Department section, the six machines shown in the two rows at the left will be under power and running actual production jobs. The three machines in the

"Visual" of Hardinge Brothers exhibit of production machinery and Toolroom equipment, Booth No. 45.





Typical die heads by Eastern Machine Screw Carp'n. Note the ingenious como ed tap and die at right in photo.

extreme left row are Hardinge Multi-Operation Chucking Machines, while the next row to the right are High Speed Precision Second Operation Machines.

In the Tool Room section, the nine machines shown in the three rows on the right of the exhibit will be under power and running on actual high speed precision tool room work. This group will include a tool room screw cutting lathe, precision lathes, plain and universal milling machines, and a vertical milling machine. Both the Production and Tool Room sections will show the high speed accuracy and versatility so essential to modern production and toolmaking requirements.

PLAN-O-MILL CORPORATION, 1511 E. Eight Mile Road, Hazel Park, Michigan, will feature the No. 1 Planetary Milling Machine in its exhibit in Booth No. 408. This

new machine differs from previous planetary milling machines in size—less than 9 sq. ft. in all—and unusual ease of operation. It has been designed especially for low-cost, high-volume thread and form milling, and is completely antifriction to provide thread milling accuracy, trouble-free operation, and simplicity of set-up with added economy.

With the use of this machine, which incorporates such earlier Plan-O-Mill features as push-button operation, coordination of feeds and speeds, and Thy-mo-trol electronic



Plan-Q-Mill No. 1 Planetary Milling Machine.

feed control (engineered by General Electric and pioneered on Plan-O-Mill) for split-thousandth of feed-in and feedaround, a complete part can be milled in a single operation in as little as 8 seconds.

No. 650 Rapiduction Automatic Cycle Lathe, by Oster Mfg. Co.





Typical New Departure bearings used in many leading machine tools on exhibition at the Show.

The exhibit of NEW DEPARTURE, Division of General Motors Corporation, Bristol, Conn., will consist principally of examples of the various types of ball bearings used in a considerable number of the new machine tools being displayed by other exhibitors at the Show.

These bearings, to be shown in Booth No. 604, are in most instances made with the most extreme accuracy tolerances and are capable of very high speeds as well as continuously rigid support of important machine parts.

The CUSHMAN CHUCK COMPANY, Hartford, Conn., will exhibit a complete new line of Air-Operated Power Chucks, Air Cylinders, and Control Equipment at Booth No. 271. The new Air-Operated Chucks will be demonstrated in actual operation; also, there will be demonstrations of the Cushman Electric Power Wrench and of methods employed in the Cushman factory for final checking of

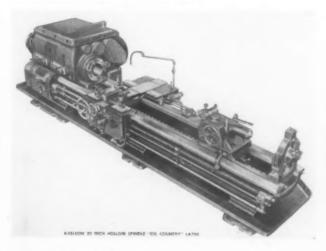
chuck accuracy.

In addition, the exhibit will include a display of Wrench-Operated Chucks and a selection of Air-Operated Power Chucks in serrated adjustable jaw, screw adjustable jaw, manufacturing and compensating jaw styles; also, 2-jaw gib type and round body type and collet chucks; and, in addition, wrench operated and collet chucks will be shown for the newer types of standard lathe spindle noses.



Cushman new "Accralock" Air-Operated Power Chuck, with serrated adjustable jaws.

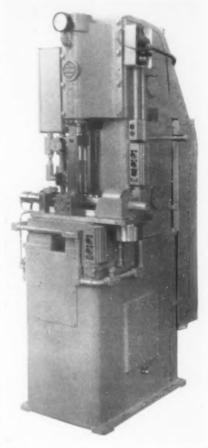
Hollow Spindle 20" Oil Country Lathe, made by Axelson Manufacturing Co. for heavy duty work, especially oilfield equipment applications.



In the broaching field, the LAPOINTE MACHINE TOOL COMPANY, Hudson, Mass., (Booth No. 642) will exhibit what is said to be the latest and most widely used broaching machines in industry. The display will consist of two large and two small vertical broaching machines.

one small and one large horizontal broaching machines, one small and one large horizontal broaching machine, and a universal broach and tool grinder.

For the purpose of demonstration. six of the machines will be tooled to produce various contours, grooves, slots, and holes in a wide variety of parts, while the Universal Broach and Tool Grinder will be set up to sharpen a typical broach among many types. The demonstration will cover novel and advanced techniques in broaching and will indicate the widening applications of the art in the metal cutting field. The exhibit will also feature a complete broaches line from .042" to 8" dia.



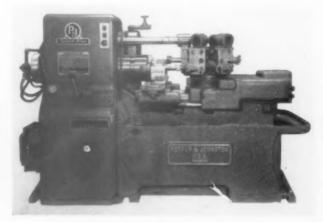
La Pointe 212-ton, 12" BPC Machine for broaching Gillette Safety Razors.

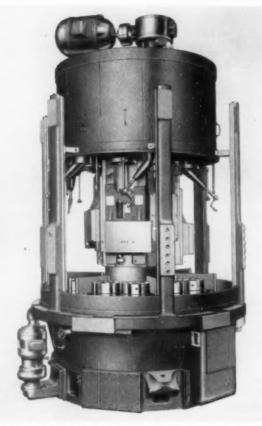
One entirely new and seven improved machines will be exhibited by the OSTER MANUFACTURING COMPANY, Cleveland, Ohio, in Booth No. 634.

The new machine, known as the Oster No. 650 "Rapiduction Automatic Cycle Lathe," is designed for forming, facing, and other cross feed operations.

Hydraulically operated cross slide, solenoid controlled valves, and other control features provide an automatic cycle of fast approach—feed—dwell—fast retraction—stop. The automatic cycle of cross slide operations can be ar-

3U Speed-Flex Automatic Turret Lathe, by Potter & Johnson Company, Pawtucket, R. I.



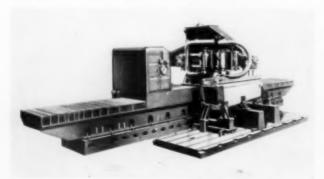


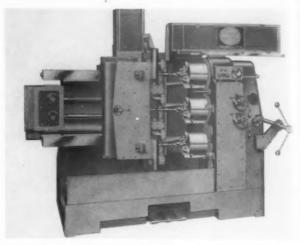
Bullard Type K Mult-Au-Matic Semi-Automatic Chucking Machine.

ranged for feed in one direction only or in two directions as required. For set-up purposes, manual control is provided.

The seven additional machines, which incorporate new developments, are as follows: the No. 601 "Rapiduction Turret Lathe." A simplified bar and chucking machine designed for manual operation; the No. 6-A "Rapiduction Power Pipe and Bolt Threading Machine" of a 6" capacity; the No. 704 "Wilco," a 4" floor type, pipe and bolt threading machine for maintenance or production threading; the No. 572X "Rapiduction Junior," a 2" floor type pipe and bolt threading machine for general purpose and long production threading; the No. 562X "Tom Thumb," a 2" portable type pipe and bolt threading machine; the No. 542X "Rapiduction Junior," a 134" floor type, production bolt threading machine designed for a wide variety of standard and special work, and the No. 531A "Tom Thumb," a 11/2" portable type bolt threading machine adaptable to many kinds of unusual threading jobs.

Unveiled at the Show will be a new Precision Way Grinder, by the Giddings & Lewis Machine Tool Company, Fond du Lac, Wis. This machine, which promises to set a new standard for ground surfaces, will be shown with G & L Boring Machines and other new developments in booth No. 315.





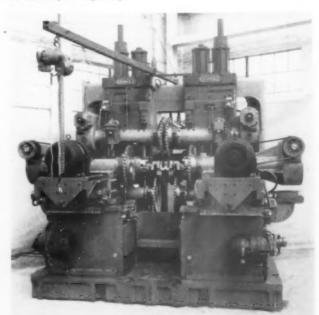
Bullard Model 30, 3-Spindle Man-Au-Trol Horizontal Lathe.

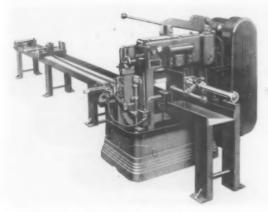
The PIONEER PUMP & MANUFACTURING COMPANY, 19679 John R St., Detroit, will have a large and complete display of Pioneer and Rollway pumps at their booth, No. 35F. The Pioneer line of coolant pumps includes nearly three hundred different models, in capacities ranging from 2.4 to 174 gallons per minute, and available in vertical and horizontal models for outside or tank installation. All models feature heavy-duty, long-hour, totally enclosed ball-bearing motors, while some models are specifically designed for functioning in shallow sumps.

The Rollway line of positive displacement pumps, which are primarily intended for pumping lubricating liquids, are available in either reversing or non-reversing types and may be had with or without built-in relief valves. Capacities range from one pint to 60 gallons per minute at recommended operating speeds of 200 to 500 RPM.

The HOLO-KROME SCREW CORPORATION, Hartford 10, Conn., (Booth No. 33D) will introduce a new member of the Holo-Krome family—a Flat Head Socket Cap Screw—which like all of the H-K line, is made of special analysis alloy steel and completely cold forged, the threads alone excepted. The complete Holo-Krome line will be on exhibit along with many interesting examples of applications.

Turn Milling Machine, by the Gisholt Machine Company, Madison, Wis., which simultaneously machines and finishes all of the cheeks and pins of automotive crankshafts prior to grinding.





Peerless 7" x 7" Automatic Power Saw, Booth No. 144.

POTTER & JOHNSTON COMPANY, Pawtucket, R. I., showing in Booth No. 43, will exhibit ten machines of the P & J line, four of which will be equipped with special tooling and in full operation. The other six models will be motorized and wired, so that they may be demonstrated running through non-metal cutting cycles. The latter include the 4D-H.S. Automatic Turret Lathe; the 5DELX Power-Flex Automatic Turret Lathe; the 5D2-9" Power-Flex Automatic Turret Lathe; 2 spindle model; the 6DRE Automatic Turret Lathe; the 6 DRELX Automatic Turret Lathe; and the 8 DXT Automatic Turret Lathe.

The machines in operation include the 3U Speed-Flex Automatic Turret Lathe equipped with special tooling for handling a cast iron subject; the 3U-H.S. Speed-Flex (high speed model) tooled for an aluminum subject; the 5D-H.S. Power-Flex, and the 5D2-15" Powerflex (2-spindle model), both tooled for handling cast iron subjects.

The standard and high speed 3U Speed-Flex Automatic Turret Lathes are to be featured as representing the latest revolutionary development in the Potter & Johnston line of automatic turret lathes, and has been developed to machine castings and forgings up to 6" in diameter. It weighs but 5000 lbs., as compared to 8000 lbs. for the smallest machine

The new No. 8-12 Production Hobbing Machine, by the Barber-Colman Company, Rockford, III. This machine which handles work up to 8", with hob slide travel of 12", features semi-automatic cycling. Designed for high production runs, the machine will accommodate magazine tooling. Shown with other new B-C tools in booth No. 523.





Super Service Precision Drilling Machine, by Cincinnati Bickford Tool Company, Cincinnati, Ohio. This precision machine, which will be exhibited in space No. 514, is shown in combination with the Bullard Man-Au-Trol Spacer. The C-B exhibit will include Upright and Radial Drills, and a jig borer of advanced design.

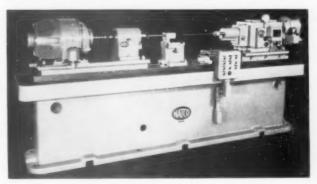
of its type previously built by the company. The newest of an old and famous line, this machine should be seen and its potentialities fully investigated, whether for immediate or future consideration.

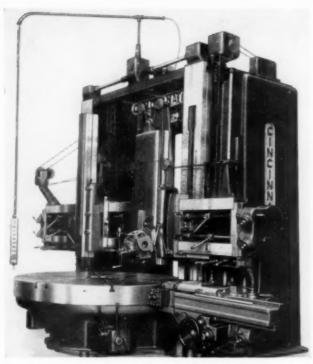
Participation of the D. A. STUART OIL COMPANY, Chicago 23, in the Show will follow the pattern of previous exhibits in many ways, but will also be a decided departure from past displays.

Attention will be focused on the solutions of daily production problems of metalworking plants through a display of "typical" parts machined with Stuart Oils, and representative tough and unusual jobs which have been licked by their proper application will also be shown. Complete descriptive data to give production men facts explaining the operations performed, machines, tools, and use of Stuart Oils on the job, will be available.

Visitors to the booth (No. 317L) will have an opportunity to discuss shop problems with Stuart engineers in attendance, while the proximity of the Stuart plant and laboratories to the Show site will offer an excellent opportunity for men of the metalworking industry to view the operations of a modern cutting fluid and lubricant plant and laboratories. The many testing devices and other interesting machines in the Stuart laboratories will be show in operation.

The Natco E9HU horizontal Deep Hole Driller, by National Automatic Tool Company, Inc., Richmond, Ind. This machine, which will be on exhibit in booth No. 4 along with the Natco A-42 Electronic Mechanical Feed Unit and other Natco tools, is especially designed for both comparatively accurate and precision deep hole drilling.



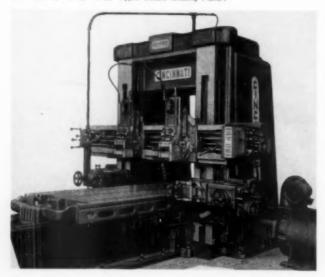


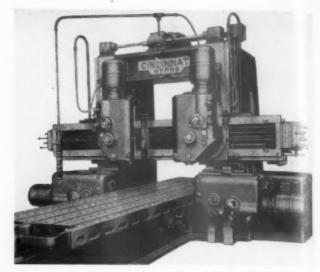
Cincinnati 6-ft. Hypro Vertical Boring Mill by Cincinnati Planer Co. The machines shown on this page wil be exhibited in space No. 220.

NORTON COMPANY, Worcester, Mass., will show in Booth No. 5 6" and 10" Type CTU Cylindrical Grinders (illustrated) among other exhibits. These machines are completely modern and designed with particular attention to operating convenience, simplicity of controls and adjustment, accuracy of sizing, safety, and accessibility of mechanism for maintenance service. The 6" machine is made in two lengths, taking 18" and 30" between centers, and both plain hydraulic and semi-automatic arrangements are available in either length.

The 10" CTU is available in six lengths—18", 36", 48", 72", 96", and 120" between centers—and all sizes may be furnished as plain hydraulic grinders. In addition, the 18", 36", and 48" machines are semi-automatics, and all sizes and arrangements include hydraulic power table traverse with automatic wheel feed, and adjustable table dwell control at each table reversal. These features are but a few among many that place these machines among the most modern in their class.

Cincinnati 48" x 48" x 16 Hypro Double Housing Planer.





Cincinnati 48" x 48" x 12' Hypro Electronic Planer Type Milling Machine.

Among other exhibits by Norton Company will be the new No. 12 Simplex Surface Finishing Machine, which incorporates in a simplified design the features of the well known Norton Crank-O-Lap. Designed for versatile applications, this machine will handle small crankshafts, as for refrigerator compressors and outboard motors. The machine is pneumatically operated, with automatic cycle for finishing, loading, and unloading.

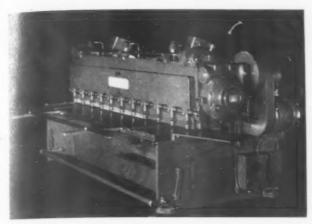
Also shown will be the Seal-O-Lap lapping machine which, as the name implies, is designed to produce an extremely flat "seal" surface on the components of rotary seal devices; the Type 16 FC Lapping Machine, a universal type capable of handling flat and cylindrical work within its capacity, and the No. 2 Bura-Way tool grinder, the latter of radically new design for grinding convex single point tools. Also included will be the No. 2 Cam-O-Matic Grinding Machine, designed to promote volume production grinding of automotive camshafts to new standards precision, surface finish and production.

Exhibiting in Space No. 39, the LUCAS MACHINE TOOL CO., Cleveland, Ohio, makers of Horizontal Boring, Drilling and Milling Machines will feature a 4" Spindle Machine with complete electronic and four-way bed. This machine, the "Lucas 460 Electronic," has been developed to answer the needs for greater production through improved facility of operation.

This machine may be operated from any position by pendant control. As an example of its versatility, all milling feeds in all directions and amount are completely controlled and, where required, combined from the pendant. As a companion feature in the exhibit, the "460" will be shown with electric controls—the first time a Lucas 4" Spindle Machine has been presented with complete electric controls. Previously this control has been installed only on the Lucas 5" Spindle Machine. Both Lucas 460 Electronic and Electric Machines are examples of the improved Four-Way Bed.

The third machine to be shown will be the Lucas "41"—a standard 3" Spindle Machine with improvements and refinements born of wartime experience. As with all Lucas machines, the "41" features high-low speeds to the single spindle. Electrical pendant control is furnished for start, stop, reverse, and jog.

KENNAMETAL INC., Latrobe, Pa. manufacturers of cemented carbides and tools, will exhibit in Booth 570 and will display a new line of mechanically-held tools having a solid cylinder of Kennametal clamped vertically in a steel holder, and backed up by an adjusting screw. As features, this tool can be indexed, both ends, to provide a succession



Cincinnati  $3/16^{\prime\prime}$  x  $10^{\prime}$  Steel Shear for precision cutting. The three machines on this page will be shown in booth No. 417.

of cutting edges, without affecting initial relation to the work; grinding is simplified and less frequently required.

Only the ends of the round insert need grinding, the contour is not disturbed; fewer tool changes are required, and consequently machine down-time is reduced. The structure of this tool permits use of triangular, square, and formed inserts as well as the rounds.

Also shown will be single-point tools for light and heavy duty machining, having advanceable, clamped-on Kennametal blanks; a complete line of conventional brazed-on-tip single point tools; solid Kennametal precision boring tools; Kennamills having either wedged-in blades of solid Kennametal, or K-M tipped blades; roll-turning tools for chilled cast iron rolls, having screwed-on K-M discs, for roughing cuts; broad-nose tools having clamped-on blades, for finishing cuts; balls for hole sizing, check valves, and hardness testing; rolls for cold rolling of steel and aluminum; and a variety of wear-resistant parts.

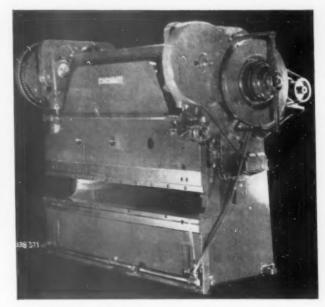
The BULLARD COMPANY, Bridgeport, Conn., (Booth No. 314) will display six machine tools at the Show, two of which have never been previously been shown. These tools, which expand the firm's 67-year old line of machine tools, are a 3-spindle Horizontal Lathe which introduces a radically new principle in shaft turning, and a "Type K" Mult-Au-Matic, the latter a high speed development of the multiple-spindle machine tool.

The 3-Spindle Horizontal Lathe operates automatically through 39 different functions, by the Bullard Man-Au-Trol control, at spindle speeds up to 1200 RPM. Tools, mounted in a vertical plane on a slide in back of the three spindles, permit complete accessibility to the work and allow chips, broken into short lengths by a unique device, to drop out of the way into the coolant.

The machine, which weighs about 20,000 lbs., provides great rigidity, permits a maximum drive up to 75 HP, and is equipped for complete manual as well as automatic operation. Movement of a single lever puts the machine under manual control for a different piece without disturbing the set-up for automatic operation.

The Type K machine offers new production economies with its tripled speed, semi-automatic chucking and adjustable stroke of slides for varying work heights. The 15-ton, 6 and 12-spindle model offers speeds from 100 to 900 RPM, while the 21-ton, 8 and 16-spindle machine offers 98 to 883 RPM. The Type K Mult-Au-Matic has 41 speed changes and 82 rates of feed available, with selective feed and common speeds at all stations for high speed output.

Also displayed will be the recently introduced Bullard Spacer, for automatically positioning work under a radial drill without use of jigs. This tool was recently previewed in The Tool Engineer and attracted considerable attention. The company will also show a Man-Au-Trol Vertical Turret



Cincinnati "130" Press Brake by Cincinnati Shaper Co.

Lathe, a 30" and a 54" Cut Master Vertical Turret Lathe, the modern version of the original Bullard Vertical Turret Lathe. Previous models of these machines created a sensation when first introduced, and it is expected that the new developments will be big news at the Show.

Visitors to the Show will have opportunity to view the highly publicized Heavy Duty Lathes, by the AXELSON MANUFACTURING COMPANY, Los Angeles, Cal., of which the new "Oil Country Lathe" is shown here. The Axelson lathes to be exhibited at the Show will include machines of their latest design, each to be shown with a full complement of accessories. Precision tools, yet suited to the heaviest production demands, these machines embody all of the advanced engineering and nicety of control that have made this line outstanding in its field.

HANNA ENGINEERING WORKS, Chicago, will show a line of standard and special Hydraulic and Pneumatic Cylinders, Valves, and other air and hydraulic accessories and appliances. Of special interest will be the Hanna system of Hydraulic Riveting, including high pressure power unit, and various types of riveters.

Cincinnati 24" Heavy Duty Shaper, with universal table.

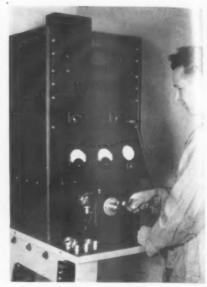




Rotary Piloting Fixture for Profilometer, by Physicists Research Co., Ann Arbor, Mich.



Proficorder, developed by Physicists Research Co., to give a magnified chart record of surface irregularities.

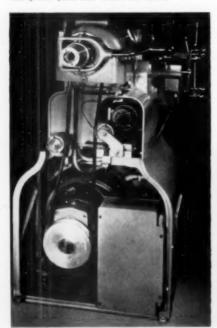


Type WAA Race Tester, by Physicists Research Co. These tools shown in Booth No. 563.

Showing in Booth No. 563, the PHYSICISTS RESEARCH COMPANY, Ann Arbor, Mich., will display a number of instruments which, to all practical purposes are "shop tools" with high potentialities in production inspection quality control and in technical research and development. These tools include a Rotary Piloting Fixture for circular tracing with the Profilometer; the Type WAA Race Tester, for measuring the surface waviness of inner and outer ball and roller bearing races on a production basis; the Proficorder, which provides a magnified chart record of the shape, height and spacing of surface irregularities, and the Type BAA Anderometer, the latter a high-speed shop instrument for obtaining over-all quality rating of assembled ball bearings.

Of these instruments, the Anderometer and Race Tester have been displayed at two or three trade shows during the past couple of years. However, they were shown in earlier forms and, in the meanwhile, have been so developed and refined that, to all practical purposes, the models to be exhibited may be considered as new tools. With the exception

New Monarch Manufacturing Lathe, with all-electric drive which provides a 100:1 range of gearless, stepless spindle speeds both forward and reverse.



of the Proficorder, which is a recording instrument, the other tools are designed for microinch readings and provide unusually wide applications in the fields for which they are designed.

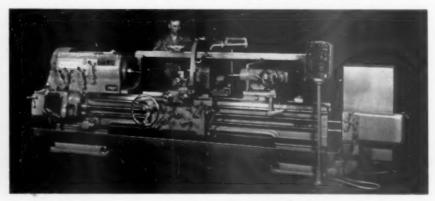
COLONIAL BROACH COMPANY, Detroit, will show new lines consisting of both pull-up and pull-down Broaching Machines as well as a new line of single ram Surface Broaching Machines. All machines are of the vertical type and in a complete range of standard tonnages and strokes.

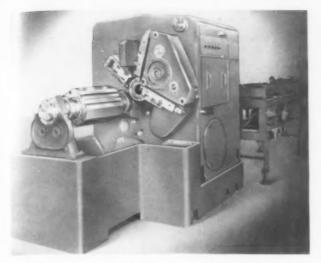
Outstanding characteristic of these new machines is the extreme attention given to obtaining every possible minute of productive time. For although broaching machines are, by nature, extremely high as to production rate, it has been Colonial Broach Company's contention that everything that can be done to keep machines running continuously, produce even more pieces per hour, and reduce frequency and duration of down-time, is a vital consideration under present-day conditions. And, as far as present advanced engineering permits, the company has met these requirements.

From these standpoints, it will be of interest that the new Colonials have an entirely new hydraulic system layout. There is greater accessibility to all hydraulic appliances, with controls grouped in a single cabinet, making for quicker inspection, adjustment and servicing. Electric controls are similarly grouped on a single panel on the opposite side of the machine, all enclosed as protection against dust and dirt.

In common with many other exhibitors who have been rather reluctant to give prior disclosure of their displays, Colonial has preferred to hold its exhibit for surprise "news" at the Show opening. It may be surmised, however, that the company's exhibit will arouse lively interest. That, however, goes for all of the broaching exhibits, considering that broaching is now a strong contender as a cost cutter in metal processing.

Model M, 20 x 72" Engine Lathe with automatic sizing controls, by Monarch Machine Tool Co.





Single Spindle Automatic Turret Lathe, Model No. 150, by New Britain Gridley Machine Div.

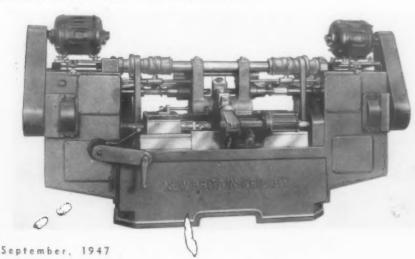
Exhibiting in Booth No. 311, the NEW BRITAIN MA-CHINE COMPANY, New Britain, Ct., will show new lines of automatic turret lathes multiple spindle screw machines, a new, double end chucking machine, and a new line of contour boring and turning machines among other items. Claims for these new tools are rather broad and quite enthusiastic, and warrant the fullest consideration on the part of attending production executives.

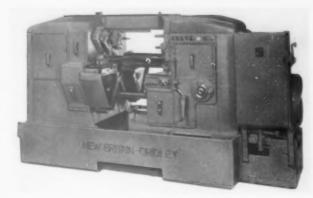
For example, the Multiple Spindle Automatic Screw Machines—fast, powerful, and designed to anticipate future tool developments, are said to out-perform anything that modern tools will handle. As proof of these claims, one machine will be set up on a brass job, running in excess of 4000 RPM and having an index time of 2.4 seconds per piece! A second machine will be set up on a steel job, with exceptionally wide forming on high carbon alloy steel.

The New Automatic Turret Lathes are designed to bridge the gap between a lathe and an automatic, and are developed for the full use of carbide tooling and for quick change-over from job to job. A new air feed device eliminates the need for stock pushers and conventional stock reel, and one man can easily load large tubes or bars from the rack, which holds a full day's supply.

The new Model 365 Double End Tool Rotating Chucking Machine is essentially a powerful high production, modern tool. Fully automatic, it features automatic chucking and unchucking, precision alignment of opposing spindles, accurate threading, quick indexing, rapid traverse on all idle motions and fully interlocked safety controls. As an item of particular interest, the machine can be used for machining

New Britain Model No. 365, double end tool, Rotating Chucking Machine.





New Britain Model No. 601, 114" Automatic Screw Machine.

two similar parts simultaneously, one on each side of the chuck. Provided with all the rigidity necessary for full use of carbide tooling, spindle speeds up to 2000 RPM make it exceptionally suitable for machining non-ferrous metals.

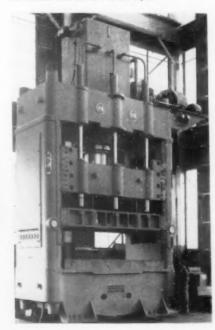
The new line of contour boring and turning machines—Models 26-36 and 27-37 Precision Boring Machines—are designed to perform precise second operation work in addition to regular jobs of straight boring and turning, facing and chamfering. These machines, which provide spindle speeds up to 7500 RPM, are versatile, precise, and strictly high production—cost cutters in every sense of the word.

The STAPLES TOOL COMPANY, Cincinnati, Ohio, manufacturer of Carboloy cemented carbide circular cutting tools, has greatly increased their production capacity and, in addition to circular tools, will show a complete line of Carboloy turning, boring, facing and roller turner tools; milling cutters; form tools; centers; and masonry drills,

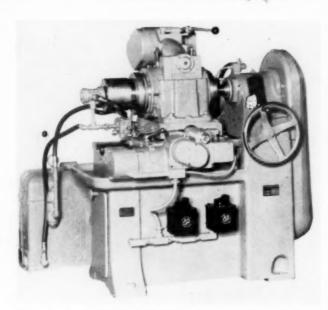
This greatly expanded line of Staples Tools will be displayed for the first time at its exhibit, booth No. 47-F. Standard and special single point and circular tools, as well as a special display featuring the patented Staples Expansion Reamer. Large working models of the reamer will be in-

cluded in a demonstration to explain the method of expanding the solid steel tool body, which provides greater rigidity and accuracy than is possible to obtain with conventional splittype reamers.

Hydraulic Press Manufacturing Company, Mt. Gilead, Ohio, wil show new H-P-M hydraulic presses, plastics molding machines and die casting machines, as well as several new appliances, in Booth No. 625. Typical of the line (but not on exhibit) is the H-P-M 1000 tone Fastraverse Triple Action Press. Compare this colossus with the man at the right.



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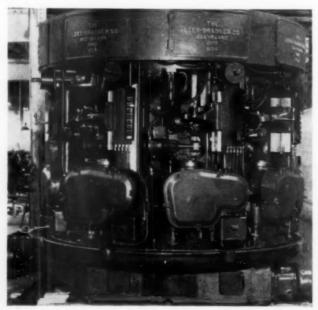
Lees-Bradner Production Thread Milling Machine, Model 40, with hydraulic chucking equipment.

ILLINOIS TOOL WORKS CO., Chicago, (Booth No. 302) will show, among other exhibits, a new and unique Inspection Recording System giving greater assurance of hob accuracy. Readings from sensitive inspection equipment are electrically recorded on what is termed a "Toolgraph" chart which shows any deviation of the hob teeth from the theoretically desired lead helix at a glance.

Each hob produced at Illinois Tool Works is subjected to this inspection system and is accompanied at the time of shipment by an individual "Toolgraph" chart showing the accuracy and specific characteristics of the tool. The hob user is certain of hob tolerances within specified limits for the class of work desired and hob performance to desired quality standards.

The cutting edge of each tooth on the hob is represented by a peak in the inked line of the chart. The series of Charted peaks forms a pattern that clearly indicates the nature and extent of any deviations in the tool itself. Because the recording system is entirely automatic and independent of the machine operator, there is no possibility of human error in the test results.

Rotary Production Gear Hobbing Machine, Model 7A, by Lees-Bradner Co.





Heavy Duty Universal Thread Milling Machine, Model HT, by Lees-Bradner Co.

The PRATT & WHITNEY DIVISION, Niles-Bement-Pond Company, West Hartford, Ct., will have an exhibit covering 6000 sq. ft. in Booth No. 55, located in the northeast corner of the hall. The exhibit, which will range from precision machine tools to fine gages, will surround a central reception space and office.

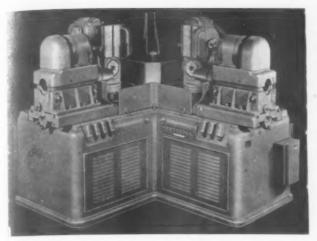
The exhibit will include one large Keller machine for Kellering automotive fender and body dies, and a smaller size for producing forging dies and plastic molds; a group of P & W Die Sinkers, both plain and universal types, for cutting forging dies, molds, and masters. Included will be an exhibit of die work of rather unusual interest.

Also displayed will be a group of precision toolroom lathes, including all special and full relieving attachments; automatic production machines for automatic centering, and for turning on centers (including shouldering, necking, and taper turning) with use of carbide tools. There will be demonstrations of the Vertical Shaper, on both tool room and die shop potentialities of the vertical ram in eliminating much special tooling; a thread milling and hobbing demonstration showing the production of either internal or external precision threads and worms; a demonstration of grinding the teeth of large precision gears, by the generating process, without use of master gears or templates; as well as a group of precision jig borers, together with both plain and tilting rotary tables. Included will be exhibits and demonstrations of the newest precision boring techniques.

The Pratt & Whitney Small Tool display will include a complete showing of taps, dies, reamers, milling cutters, and screw plates, plus carbide tools and many special developments, while the Gage display will feature basic measuring equipment, standard gages of all kinds, and the complete line of P & W Electrolimit and Air-O-Limit Comparators that form the basis for statistical quality control systems. Also included will be a display of Kellerflex tools, with flexible shaft machines for bench, floor, and suspension, from ½ to 2 HP.

The tremendous advance in recent years in the general utilization of hard metal carbides, not only for cutting tools but also for all kinds of machine parts, will be emphasized by the exhibit of the CARBOLOY COMPANY, INC., Detroit, to those visitors to the coming Show who can recall the last previous Exposition in 1935. In 1935, utilization of carbides was still pretty much in its infancy and almost every application was different from the next. In contrast, the 1947 Carboloy exhibit, (Booth No. 655) will be built around the some half thousand different carbide parts which have become "standard catalog items".

While these include the company's well-known lines of standard Carboloy cutting tools there will be added such items as solid carbide boring bars, all kinds of standard shapes of carbides for use in resisting wear in machinery, sheet metal dies and punches with carbide nibs and segments, wheel dressers, carbide rods, carbide tipped lathe



Sheffield Chamfering Machines will chamfer, point, or burr gear teeth.

centers, bushings, milling blades, balls, twist drill tips, guide rings, masonry drills, scraper blanks, grinding cones and other tools and accessories.

Providing action in the exhibit will be a complete demonstration set-up of latest carbide tool grinding techniques, also the new Carboloy-set Ingersoll-Rand Jackbits which, it is reported, promise to revolutionize ore mining.

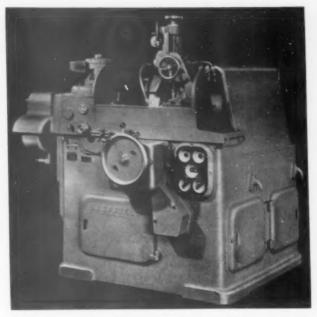
There will be a number of new and highly interesting developments at the exhibit of the HEALD MACHINE COMPANY, Worcester, Mass., which will be located in Booth 511 at the Show. There will be three brand new lines of Heald Machines—Internal and Surface Grinders and Bore-Matics—all provided with many new features designed to give increased production with greater accuracy, a superior finish, and reduced maintenance.

There will be exhibited to Bore-Matics, nine of which are new. These machines, which include a Tri-Way, have capacities to handle either large or very small work. In addition, there will be shown a new Tool Sharpener, three Surface Grinders, of which two are of new design, and seven Internal Grinders, including Gage-Matic, Size-Matic, combination and plain Internals and centerless Internals. Six of these latterly listed machines are of entirely new design.

A book would hardly suffice for adequate description of these machines, which offer all of the time-tested qualities of the Heald line the while they promise economies far beyond those afforded by previous models. For example, the Bore-Matics (termed by Heald "the most versatile precision machine tools") were originally designed as finish boring machines, but are now largely used for turning, facing, milling, chamfering, and other operations entirely beyond the original concept. This display should be included in the itinerary of every visitor to the Show.

The CINCINNATI PLANER COMPANY, Cincinnati, Ohio, (Booth No. 220) will show a 6-ft. Cincinnati Hypro Vertical Boring and Turning Mill equipped with one left ram type rail head, one right hand turret type rail head, and one right hand side head. This machine will feature constant facing speed, maintained electronically regardless of diameter of work, together with smooth adjustment of table speed in infinite increments, electronically, with table speeds indicated by electrical tachometer in pendant station. The machine will be driven by the new Cincinnati Hypro 50 HP, single shift, variable voltage drive.

Also shown will be a 48" x 48" x 16" Hypro Double Housing Planer with two rail heads and two side heads. The machine will be equipped with the new improved Cincinnati Hypro 35 HP variable voltage motor drive, hydraulic safety table stop, shockless pneumatic tool lifters, and will provide



Sheffield Thread and Form Grinder, on which either the multi-form wheel or the conventional single ribbed wheel can be employed. The machine can be used for precision gage work, for standard commercial production, and for crush dressing of multi-form grinding wheels.

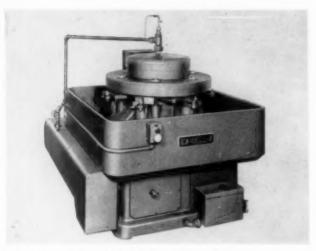
extra high cutting speeds using carbide tipped tools. Also provided will be an electrical table speed indicator, in pendant station, reading in feet per minute. A 30" x 8' Hypro Hydraulic Openside Planer will also be shown. This machine, equipped with two rail heads and one side head, will have shockless, hydraulic tool lifters and the new Hypro remote finger-tip control for infinite adjustment of table speeds.

Among other items in the exhibit will be a 48" x 48" x 12' Hypro Electronic Drive Planer Type Milling Machine equipped with four 834" quill, dual purpose, 40 HP milling heads for high speed and carbide tools. Control of head and table feeds are from a centralized pendant station through dual head and table electronic drives, automatic spindle load control with feed tachometers, and individual spindle load instruments.

Along with other new and interesting developments by Cincinnati Shaper, these machines are futuristic rather than

The Sheffield Measuray provides non-contact continuous or spot checking of thickness of various types of materials at a speed as fast as light.





Ex-Cell-O Automatic Valve Grooving Machine. Booth No. 578.

merely ultra-modern and are designed for extreme nicety of control together with the high output which is now demanded in modern manufacturing practise. The machine, rather than the operator, controls output and quality.

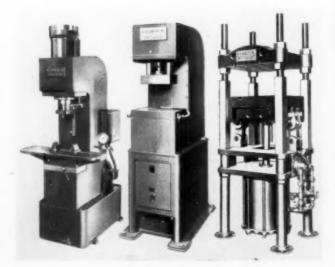
The exhibit by the EX-CELL-O CORPORATION, Detroit, (Booth No. 518) will include a number of special automatic machines for multi-operations on automotive parts, precision Boring Machines, precision Thread Grinding Machines and other tools of the Ex-Cell-O line, all of which have either been newly designed or improved for present day as well as future production demands.

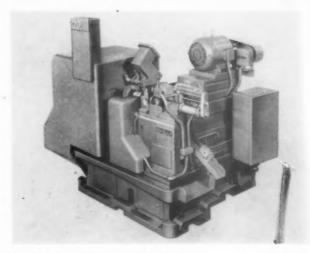
Shown is a Special Automatic Machine for cutting two grooves and chamfering valve stems at the rate of 1520 pieces per hour. This machine, built to Ex-Cell-O precision standards, performs three operations on continuous machine cycle and, since the operator is merely required to load and unload, may be termed typical of the trend to automatic

functions and combined operations.

A leader, in this trend, is a fully automatic Piston Boring







Ex-Cell-O Automatic Piston Boring Machine.

Machine that receives aluminum alloy pistons from a chute, just as they are cast, completely finishes the piston pin holes, and ejects the bored parts onto a conveyor. Output is at the rate of one piston, finish bored, every 30 seconds, and bores are easily held within .0003" for an entire day's run without tool adjustment.

Other machines in the exhibit will include a precision machine for grinding small forms, a vertical precision Cylinder Boring Machine, for precision boring of automative cylinder bores, and many other machines and tools in the company's extensive line of cost-saving equipment.

In Booth No. 144, at the Tool Show, two Peerless power saws, by the PEERLESS MACHINE COMPANY, Racine, Wis., will make their first, large-scale public demonstration of cutting metals automatically. Frank T. Wruk, Assistant Works Manager and an authority on power sawing, will be in charge of the demonstration and will be prepared to cut exhibitors' test samples.

This demonstration of full automatic sawing will center around the company's latest development—the 7" x 7" machine with mechanical pull-up—which is equipped, as standard, with an automatic length gage for gaging lengths \( \frac{1}{8} \)"

Geargrind Universal Oscillating Grinder, by Gear Grinding Machine Co.





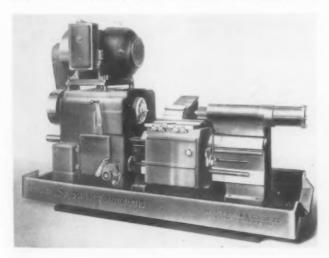
Worm Gear Hobbing Machine, by Gould & Eberhardt, Inc. Booth 41.

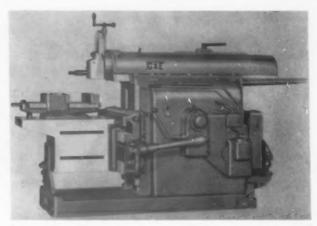
to 48". Metal is fed forward through a Four-Sided Saw-Frame (a patented feature of the Peerless Mechani-Cut power saw), which surrounds the metal to be cut instead of straddling over the work. In order to permit maximum pressure on the saw blade, without shortening blade life unduly, a unique type of backing plate is provided. Other tools in the exhibit will include a 11" x 11" plain type machine, without automatic conveyor, while preliminary plans include the announcement of a new type of saw blade grinder which will correctly sharpen used blades from 3 to 6 times.

While not on exhibit by itself, the Trabon Type M positive feed Centralized Lubricating System, by the TRABON ENGINEERING CORPORATION, Cleveland, Ohio, will be shown on machinery manufactured by the NATIONAL MACHINERY COMPANY, Tiffin, Ohio, and the AJAX MANUFACTURING COMPANY, Euclid, Ohio. Automatically operated, the Trabon Systems are to be shown installed on a 2" Ajax Air-Clutch Operated Forging Machine, a 500-ton Ajax High Speed Forging Press and on a National Machinery Company No. 1½ High Speed Forging MaxiPress.

Among the advanced, cost-cutting tools to be exhibited at the Show, the SENECA FALLS MACHINE COMPANY, Seneca Falls, N. Y., (Booth No. 3) will have a showing of Automatic Work Loading among other feature developments. While the idea of automatic work loading is not new, and has been variously applied, the Seneca Falls development is nevertheless novel and destined to pioneer the method in the machine tool field.

A Lo-Swing IMP Automatic Lathe (similar to the machine illustrated) will be equipped with a rotary type loader and a novel application of tooling, since both head and tailstocks revolve in this machine. The machine is





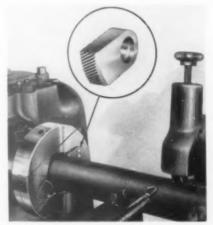
32" Industrial Shaper, with 16 speeds and all-helical gear drive, by Gould & Eberhardt, Inc., Irvington, N. J.

entirely automatic in operation. Parts which have been previously bored are placed in a loading chute and fed by gravity into openings in the rotary loader, which indexes the pieces to automatic pick-up by the continuously revolving spindles of both heads. After being machined, the part (which is then completely stationary) moves into a discharge chute. The machine controls output, with utter safety for the operator.

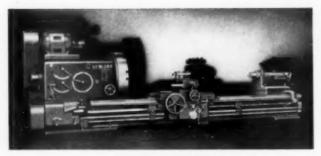
Other exhibits by Seneca Falls will include their newest automatic lathe—the Model AR Lo-Swing which, in capacity, fits in between the Models LR and R-14 Heavy Duty Lo-Swing. This machine combines features which assure case of change-over, operating control, and a flexibility which, it is claimed, has not been previously attained in a 100% mechanically operated lathe.

Also to be shown is the Seneca Falls Automatic Work Driver. This device, which is self-centering and quick acting, and designed to eliminate dogging, incorporates an improved jaw design to provide overlapping contact for surer and quicker grip on smooth finished as well as hard surfaced materials. Rounding out an interesting and versatile grouping of tools will be Lo-Swing Automatic Drilling and Centering Machines.

At right, improved Seneca Falls Automatic Work Driver; at left, Seneca Falls Model AR Lo-Swing Automatic Lathe; below, Automatic Work Loading Equipment installed on Lo-Swing IMP Automatic Lathe, by Seneca Falls Machine Company.

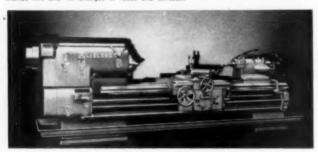






Le Blond  $40^{\prime\prime\prime}$  x  $156^{\prime\prime\prime}$  Heavy Duty Engine Lathe, with 54 changes of speeds and threads.

Le Blond 25" x 72" Heavy Duty Engine Lathe, with automatically lubricated quick change box and 48 changes of feeds and threads.



Shown by LEHMANN MACHINE CO., St. Louis, Mo., will be a line of lathes ranging from 16" to 30". These machines, including the Lehmann Hydratrol, will be on demonstration. Also shown (booth No. 268) will be selections from the Boring Tool Division, including block type Boring Bars, micrometers Fly Cutter bars, Car Wheel type Bars and other tools of the Lehmann line.

Among the unusual and interesting exhibits at the Show will be the "Lanroll Attachment," developed by the LANDIS MACHINE COMPANY, Waynesboro, Pa., (Booth No. 101) for rolling straight threads on automatic screw machines and turret lathes. Thread rolling, as we know, is a very fast and economical method of generating screw threads, but is usually handled as a secondary operation on separate, special thread rolling machines.

With the Lanroll Attachment, the threads may now be rolled concurrently with other machining operations on turning machines. Since, however, a thread rolling attachment is primarily a single purpose tool, it must be designed—for use on screw machines or turret lathes—for any one particular diameter, pitch, form, and length of thread; as well as for the machine on which it is to be used.

In applying the Lanroll Attachment to standard automatic screw machines having tool slides, special holders or shanks are designed for the particular make or model of machine on which it is to be used. Once adapted to a job,

Lanroll Attachment, by Landis Machine Co., for rolling straight threads on automatic screw machines and turret lathes.



however, the attachment will complete a threading job under conditions where conventional closed or self opening dies could not function. As, for example, where shoulders or other interferences would preclude use of a die and where, under such conditions, the threads would have to be rolled anyway as a secondary operation. The tool is unusual and should be seen by all who are concerned with the manufacture of screws products.



Le Blond 16" x 54" Model RT Heavy Duty Lathe, with single lever control head stock.

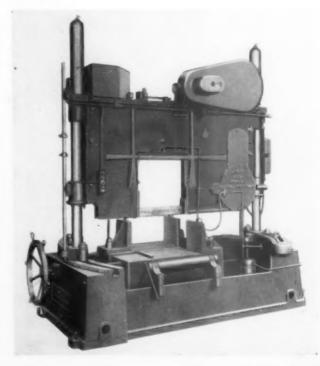
Four new and nine other lathes, the latter redesigned and improved, together with numerous accessories and attachments, will be exhibited by the R. K. LeBLOND MACHINE TOOL COMPANY, Cincinnati, Ohio. The display, to be shown in Booth No. 507, is to contain representative models of the entire LeBlond line, ranging from the 13" Bench Regal up to the 40" Heavy Duty Engine Lathe, Also on operating display will be the 6AC Automatic Crankshaft Lathe and the No. 2 Cutter Grinder.

The new lathes are the 16" Model RT heavy duty lathe with single lever control headstock; the 16" RT H.D. lathe with variable speed headstock; the 25" heavy duty engine lathe, and the Dual Drive lathe. The first of these (shown in photo) is a combination gear-belt drive lathe with a single lever controlling 16 spindle speeds ranging from 20 to 1025 RPM, or 30 to 1537 RPM. The second, which combines many of the features of the first, has a variable speed headstock providing a virtually unlimited number of spindle speeds ranging from 6 to 1500 RPM.

The new 25" H.D. Engine Lathe is the first machine of that type and size to be built with a totally enclosed and automatically lubricated quick change box. Without change of gears, 48 changes of feeds and threads may be obtained from the direct reading plate mounted above the tumbler shifter.

The 40" and 50" H. D. Engine Lathes, of which the 40" x 156" is illustrated, are the first of the LeBlond heavy duty

Marvel No. 24 Hack Saw Machine (capacity  $24^{\prime\prime\prime}$  x  $24^{\prime\prime\prime}$ ) by Armstrong Blum Mfg. Co., Chicago. This is said to be world's largest hack saw machine.





The Torquomatic tapper, by Chas. L. Jarvis Company, Middletown, Conn.

engine lathes to be built with totally enclosed, automatically lubricated quick change box which provides 54 changes of feeds and threads without change gears. All of these machines, as well as the rest of the geared-head LeBlond line, feature flame hardened and ground steel bed ways front and rear as standard equipment, while all geared headstocks are provided with hardened and ground steel gears.

The fourth machine—the Dual Drive—was introduced earlier in the year although this will be its first public showing as an operating unit. Said to be an entirely new design, the Dual Drive headstock contains two separate driving mechanisms—a gear drive and a direct belt drive. A single lever, fitted with direct reading speed plate and guiding arrow, controls 12 spindle speeds ranging from 28 to 1800 RPM. The feed box, totally enclosed, is lubricated automatically and provides 48 feed and thread changes.

While all of these machines will attract their share of attention—as indeed they should!—it is possible that the

New Illinois Fine Pitch Gear Generator, by Illinois Tool Works, 2501 North Keeler Ave., Chicago 39, Illinois. Booth No. 302.





The Buhr Power Index Table, by Buhr Machine Tool Company, Ann Arbor, Michigan. Booth No. 158.

6AC Automatic Crankshaft Lathe will be viewed with more than ordinary interest by automotive production executives. Also of interest will be the 25"/50" x 14'7" sliding bed Gap Lathe, the latter providing a swing range not obtainable in conventional bed lathes.

GOULD & EBERHARDT Inc., Irvington, N. J., will show the latest developments in G & E Shapers and Gear Hobbing Machines, all featuring a number of outstanding improvements. Among them, two radically new developments—16 ram speeds and all-helical gear drive—are incorporated in the new G & E Shapers.

Ram speeds are easily and quickly selected by means of only two gear shift levers, and, as they are arranged in geometrical progression, the 16 speeds provide an exceptionally wide range of strokes to suit all classes of work. For that matter, the all-helical drive alone is noteworthy, with its evident greater quietness and promise of extended tool life. These machines warrant the most serious consideration on the part of economy-minded production executives.

That G & E should exhibit gear hobbing machines is a "natural" considering the company's many years of experience in this field. At the Show, the company will introduce its new, electrified, push-button operated Gear Hobbers with a display of its 12H, 24H, and 48H sizes. These machines are suitable for cutting spur gears, helical gears either differentially or nondifferentially and worm gears, by the infeed method. The machines can also be arranged for hobbing splines or worms with low number of teeth.

While these machines retain the time tested G & E vertical cutting principle and the dual-lead worm gearing for the table drive, they are otherwise completely redesigned for greater rigidity and, consequently, higher output. Hob spindles have been made larger, while work tables have been enlarged to provide better support for the work.

In booth 486, WEDDELL TOOLS, Rochester 11, New York, will display their complete line of inserted blade cutters and accessories. Featured will be the new Super Carbide Tipped Tri-Bit Face Mill, designed for high production milling of frail castings. Other tools shown, beside the complete line of face mills which this company manufactures, will be adjustable bladed boring bars.

hollow mills, and special cutting tools.

Hydraulic Gear Pump, by HYDRO-POWER, INC., Springfield, Ohio. Called the "Cub-line," and precision built for unusually high efficiency, the new units are ideal for hydraulic applications in such fields as machine tools, farm equipment, construction and materials handling equipment. Shown in booth No. 625.





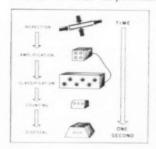
Federal Sortron-Matic, with hopper feed, for simultaneously measuring and sorting ends and diameters for piston pins, in 8 categories, at the rate of 5400 per hour.

The exhibit by FEDERAL PRODUCTS CORPORATION, Providence, R. I., will include a line of Sortron-Matic Inspection machines so designed that, to all practical purposes, they may be said to be endowed with brains. Shown (with girl operator) is a Sortron-Matic, in the plant of the Esterbrook Pen Company, which sorts pen barrels, for length and diameter simultaneously, at the rate of 3600 per hour in 8 categories. The diagram shows the complete sequence of operation.

Also shown is a Sortron-Matic (with Detroit Power Screw Driver Company hopper) for sorting balls or rollers into 8 categories, all automatically and at the rate of 5400 per hour. Yet another machine—not shown—sorts piston pins to within .0002" at comparable speed. These machines will be demonstrated.

Other Federal inspections tools, to be exhibited, will

tools, to be exhibited, will include the Electricator, lately applied to Norton Grinding



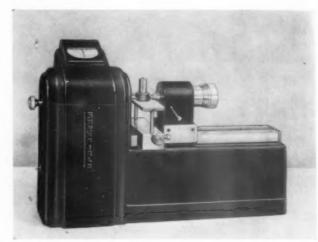
The Sortron-Matic, by Federal Products Corporation, Providence, R. 1
This machine, photographed in the plant of the Esterbrook Pen Company, inspects, sorts and counts pen barrels, in 8 categories, at the rate of 3600 per hour. The diagram (small photo) shows the complete sequence of operations.



Machines. This tool in combination with a machine deveralled the Nortonizer, automatically backs the wheel  $f_{\Gamma_1}$  the work as soon as it is ground to required dimension. In line with grinding, the company will also show the  $A_{\Gamma_1}$  Continuous Grinding Gage, a tool that must be seen to fully appreciated.

Along with the tools mentioned above, Federal will show a very complete line of dial indicators, micrometers at a other automatic inspection instruments, all designed for ultra-fast operation and meticulous control of quality.

The CARBORUNDUM COMPANY, Niagara Falls, N. Y. will feature what is said to be a sensationally new Grinding Wheel known as Series 20. Their booth—No. 32—is to be an attractive, modern lounge with display background with a color animation of Niagara Falls as a centerpiece. Visitors may discuss abrasives and their applications with company representatives.



The Sheffield Horizontal External Measuring Instrument, available with Electrigage in three amplifications—which fill the normal requirements in measuring rectangular and tapered or straight cylindrical and threaded parts.

In view of its unique position in industry, and also because of its wide diversity of products in addition to engineering and contract service work, it is to be expected that the exhibit of the SHEFFIELD CORPORATION, Dayton, Ohio, will attract more than usual attention. The company will exhibit in Booth No. 202.

In addition to a wide range of gages and precision measuring instruments, for which the company is noted, Sheffield will show machine tools, a wide diversity of thread cutting tools and keyway cutters, and—a field in which it has pioneered—plunge form grinders. The machine tool line includes gear chamfering and gear burring machines; microform and annula form grinders; and various devices for cruch grinding.

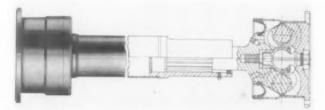
Sheffield gages and comparators are too widely known to require detailed listing here; however a new gaging instrument, known as the Measuray and applicable to almost any production process where it is desired to measure and regulate the thickness of material, is one of the "news" in the Sheffield line. Utilizing an entirely new X-ray and electronic application for non-contact, it continuously or spot checks thickness of all types of moving material.

Practically the entire executive personnel of the company, as well as field engineers from various areas, will be in attendance at the exhibit. These include Louis F. Polk, pres.; vice-presidents J. P. Bernard, C. H. Reynolds, Albert and Paul Polk; secretary E. T. Noe, Jr.; A. O. Ahlers, general sales manager; W. I. Wilt, R. Y. Moss, Carl Linxweiler, Louis Mahlmeister, Victor Boll, W. F. Aller, Clarence W. Hamilton, P. J. Swales, J. T. Welch, and Irvin Snyder. A number of these men are prominent in ASTE activities.

Showing in booth No. 2, VICKERS, INCORPORATED, betroit, will exhibit a most comprehensive line of hydraulic antrol equipment including pumps, control valves, control semblies and power units. Many of the new units to be atured are the gasket mounted designs, these being projection models of a few units of this type which have had vide acceptance and have been proven in the field.

A new line of fractional H.P. Variable Speed Transmissions will also be featured. These transmissions augment the wide range of sizes of Vickers variable speed transmissions of the larger H.P. ratings which have been successfully used in many industries for the past several years. Many of the units will be in operation, utilizing mockup arrangements to simulate boring, turning, drilling, milling and other metal working operations.

Hydraulic power units, including the standard type and the "custom built," and representing a new trend in hydraulic machine design and installation, will also be featured. The "custom built" units, designed and built to specific requirements, are a combination of standardized Vickers pumps and controls. These, together with many hydraulic system construction details including piping, manifolding, and hydraulic accessories, helpful to the users of hydraulic control equipment, will be shown in an exceptionally interesting exhibit.



Rzeppa Constant Velocity Universal Joint, by Gear Grinding Machine Co.

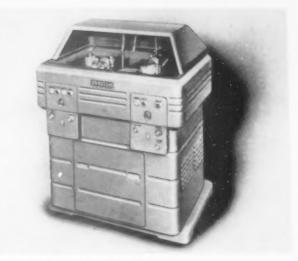
The CHARLES L. JARVIS COMPANY, Middletown, Ct., which has recently acquired the Dowding Division of the Henry L. Hanson Company at North Attleboro, Mass., will exhibit Jarvis Power Tools in Space 313C. Demonstrated will be the new and much publicized torque-driven tapper—The Torqomatic—and a newly acquired line of quality taps and dies.

The company claims that its new torque-driven Tapper is the most efficient and productive tool on the market, and visitors will have opportunity to judge its efficiency and to see how it is able to tap practically any material with finger tip pressure.

Exhibiting in booth No. 153, LOVEJOY TOOL COMPANY, INC., Springfield, Vt., will show their complete standard line of face milling cutters in diameters from 2½" through 24". This line will feature their "positive-locking" blades and the interchangeability of blades throughout the complete range.

They will also display their new "Cutsall" milling cutters, which feature tool-bit type, Carboloy cemented carbide tipped blades for positive and negative rake cutting, and many other standard and special tools as well as the new Lovejoy carbide-tipped end mills and Lovejoy holders.

Walker Magnetic Chucks, by O. S. WALKER COM-PANY, Inc., Worcester, Mass., will be in operation on many of the surface grinders at the Show. Included will be Rectangular, Swivelling, Rotary and Special Type Magnetic Chucks, Demagnetizers and Planer Parallels. The latest development by this company is a permanent chuck—the largest ever produced—weighing 90 pounds and only 3-3/16" high.



Ex-Cell-O Style 40 Automatic Tool Grinder.

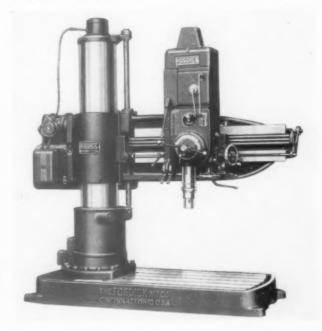
THE FOSDICK MACHINE TOOL COMPANY, Cincinnati, Ohio, will exhibit a wide range of Sensitive and Radial Drills, in space No. 15, along with a Jig Borer of ultra-modern design. The Radial Drills incorporate a number of new and outstanding features, including a protected neon light that illuminates the spindle—and consequently the workpiece—regardless of the position of the head on the arm.

Another feature is the interlocked clamping of head and column with the engaging of the feed mechanism. Thus, the operator can't "forget" to play safe; furthermore, he can change tools without disturbing the position of the head.

Of particular interest is a tool *ejector*, by which the operator need only move the spindle to extreme position to automatically eject the drill.

The 13" to 19" Column Radial Drills, by the Fosdick Machine Tool Company, Cincinnati. Shown in small photo is a new type electric light, developed by Fosdick and incorporated on all of the company's radial drills. A long neon tube provides light to the spindle at any position of the head. Booth No. 15.





As previously implied, most of the exhibitors have been working at fever heat to get their displays ready in time for the Show opening, and while considerable descriptive matter has come to hand, photographs have not been generally available. But now, as we go to press, photographs and belated releases of new tools are literally pouring in.

Many of these tools are sensational, if not actually revolutionary, and while they warrant more than usual publicity, we cannot possibly go into detailed description as we prepare to close the book. As far as possible, however, we will show photographs of the more outstanding tools in a line, with the name of the exhibitor, the booth number (when this is known) and a descriptive caption.

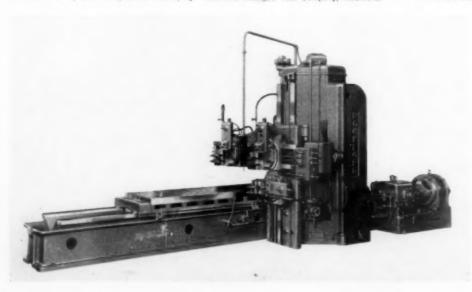
BROWN & SHARPE MFG. CO., Providence R. I., will exhibit a new line of Grinders and Automatic Screw Machines along with many other new developments in machine tools, small tools and precision instruments. Booth No. 505.

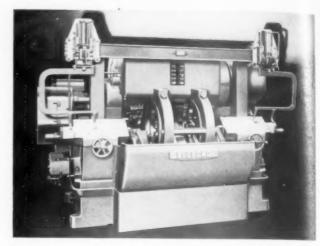
Exhibiting jointly with AHLBERG BEARING COM-PANY, Chicago, who will exhibit new and reground antifriction bearings, the BOWER ROLLER BEARING COM-PANY, Detroit, will show applications of roller bearings to high spindle speeds.



The Rockford Hy-Draulic 36" Stroke Slotter.

The Rockford Hy-Draulic Openside Planer, by Rockford Machine Tool Company, Rockford.





Automotive production executives will find the automatic crankshaft turning lathes, by LeBlond, of more than usual interest. The photo shows one model of these cost cutting machines.

Of special interest to ASTE members, the American Society of Tool Engineers and the American Foundrymen's Association will co-sponsor the Friday, September 19 technical session of the Machine Tool Congress, which meets concurrently with the 1947 Show. F. J. Schmitt, chairman of Chicago Chapter, will preside at the joint meeting, to be held at 8 P.M. at Hotel Sherman.

Myron S. Curtis, assistant director of engineering. Warner & Swasey Company, Cleveland, will speak on "'Turning' Points in the Metal Working Industry," and T. E. Eagen, past chairman of Gray Iron Division, AFA, and chief metallurgist, Cooper-Bessemer Corporation, Grove City, Pa., on "When and How to Use Cast Iron."

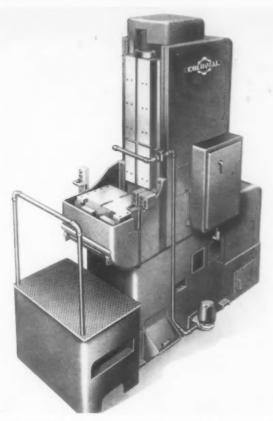
Other Congress speakers will include C. F. Kettering, G. M. research consultant, and Fulton Lewis, news commentator. Other sponsoring groups are American Machine Tool Distributors Association, American Society of Mechanical Engineers, National Electric Mfgrs. Ass'n, Chicago Technical Societies Council and the Society of Automotive Engineers.

Exhibiting in booth 158, BUHR MACHINE TOOL COMPANY, Ann Arbor, Michigan, will show several fixed center type Multi-Spindle Drill Heads, a Buhr-Matic hopper feed double and Drilling Machine, and a new bench type Tapper. Also shown will be a power Index Table designed to provide fast and shockless indexing with lowered operator fatigue. Many of the tools on exhibit will be in operation.

ROCKFORD MACHINE TOOL COM-

PANY, Rockford, Ill., will show their line of machine tools including the 16" to 28" strokes Hy-Draulic Shaper-planer, a new 36" open-side Planers, and the new Hy-Draulic Slotters. These tools are all new and incorporate features that invite closest consideration on the part of visiting production executives.

The hydraulic drive, which is a feature of this line, implies smooth cutting and, in many instances, permits of operations that would be extremely difficult with conventional mechanical operation. As an example of Hy-Draulic Shaper work, a keyway only 1" long may be cut. Booth No. 526.



Single-Ram type Surface Broaching Machine, by Colonial Broach Company, Detroit.

ARMSTRONG-BLUM MFG. CO., Chicago, will show a complete line of hack saw and band saw machines. Featured will be an entirely new Marvel Hydraulic Band Saw Machine—No. 15—which employs an entirely new development in saw blades and which is said to be establishing amazing records in speed and accuracy in the cutting-off of bars up to 15" x 15".

Also, on exhibition, will be what is said to be the world's largest reciprocating back sawing machine—24" x 24" capacity. The "unveiling," at the Show, is expected to reveal sawing machines that practically "do their own thinking."

In addition to representative models of its established lines, (booth 123) the CLEEREMAN MACHINE TOOL

COMPANY, Green Bay, Wis., will feature a new Single Unit Sliding Head Upright Drilling Machine—Model 375—which incorporates many innovations, and a new Electronic Control Jig Borer with an exceptionally accurate power driven table.

The latter machine is designed to not only locate and bore holes to "tenth" limits, but to locate and mill surfaces within the same limits of tolerance. In view of a sharp demand for versatile, precision machine tools, it is expected that the Cleereman exhibit will arouse more than usual interest.

Model 325 Single Unit Sliding Head Upright Drilling Machine, by Cleereman Machine Tool Company.



Exhibiting in Booth No. 111, the LEES-BRADNER COMPANY, Cleveland, Ohio, will feature production Gear Hobbing Machines and Universal Thread Milling Machines as well as a brand new Ultra-Speed Gear Hobber. The latter, designed and built for use with carbide tools, is capable of being operated at spindle speeds up to 1800 RPM.

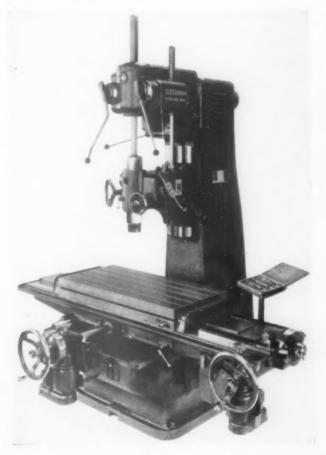
The 7-A Rotary Production Hobbing Machines are built in four types—single spindle, and 4, 6, and 8 spindle. On the latter (multi-spindle) tools, each spindle may be set up for the same or for a different job, each spindle being quite independent of the rest. The tools feature full push button control and provide automatic operation with manual operation furnished to facilitate setting up changing jobs and hobs, and checking and gaging.

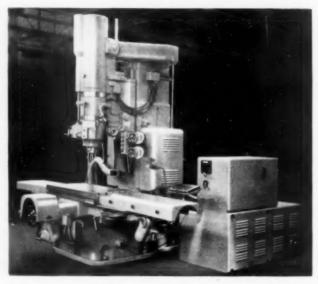
These machines incorporate many other novel features, including the exclusive L-B rapid traverse differential, which eliminates the need for a rapid traverse clutch. In connection with the hobbing machines, a new electric hob shifter will also be displayed. With this device, the hob spindle is electrically unlocked, shifted a predetermined amount, and again clamped before starting the next cut.

Of the Thread Millers, Models 40 and RT will be shown. Both of these tools are semi-automatic in operation, the cutter being automatically brought in to the required depth against a positive micrometer stop, fed across the face of the part being threaded, and, upon completion of the cut, automatically withdrawn from engagement with the work.

Both tools are equally suited to either internal or external thread milling. The Model HT machine, which may be arranged with the new L-B automatic cycle, is fully universal and will handle both or hob type work as well as single cutter or disc type thread hobs. The internal working of several of the Lees-Bradner machines, with their advanced engineering, will also be on exhibit.

The New Electronic Control Jig Borer, by Cleereman Machine Tool Company, Green Bay, Wis.





Among interesting exhibits at the Show will be the No. 2C Jig Grinder, by Pratt & Whitney, Div'n, West Hartford, Conn. Originally conceived in 1928, it has since been refined until the new '47 model may be said to be the last word in an ultra-precision grinder for accurate spacing and sizing of holes in jigs and fixtures. In operation, and general mechanism, it is similar to a jig borer; however, it differs from a conventional hole grinder in that the work does not rotate. Rather, the wheel head has an adjustable circular motion and is fed outward until hole is ground to size.

Showing in Booth No. 670, the GEAR GRINDING MACHINE COMPANY, Detroit, will exhibit the Geargrind Type OG-9 x 6 Universal Oscillating Grinder, the Geargrind Type GG-10 x 24 External Involute Gear and Spline Grinding Machine with automatic wheel feed, the Form-Sprag Over-running Clutch, Ballflex Anti-Friction Flexible Coupling and the Rzeppa Constant Velocity Universal Joint, the latter unique in the exhibit in that it is the only item not brand new.

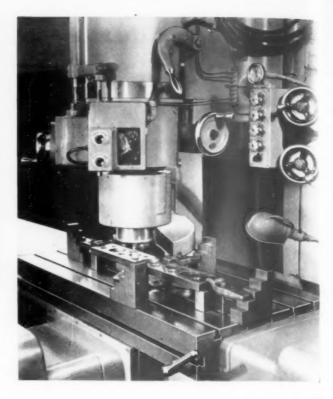
The Type O Universal Oscillating Grinder is an extremely versatile tool that will grind internal and external ball and spherical radii as well as straight and tapered hole grinding and straight and tapered external grinding with equal facility.

The Type GG-10 x 24 Gear Grinder is an automatic machine with many advanced and unusual features. In operation, it first rough grinds the teeth, then, after all teeth have been "roughed"—a term used advisedly—the machine stops. The wheel is then dressed, after which the finish passes are taken in the conventional manner. Production is said to be extremely fast.

MONARCH MACHINE TOOL COMPANY, Sidney, Ohio, (Booth No. 208) is to demonstrate thirty turning machines, at the Show, along with manufacturing techniques which, in some instances, are revolutionary. These include Monarch Automatic Sizing, a completely new method of converting a standard engine or toolmaker's lathe into an automatic machine for such work as step shaft turning, boring, facing or contour turning or any combinations of these. An exclusive Monarch development, the automatic sizing equipment will be available on all of the company's 14-inch and larger lathes.

We shall not attempt to describe all of the thirty machines which, with their many functions and applications, imply a complete turning tool plant of considerable scale and which will entail several hours of interesting study on the part of visitors. Sufficient to say that these machines, with their accessories and appliances, are as modern as tomorrow and, without exception, are designed to cut manufacturing costs.

Besides the machine first described, however, two other



machines merit especial attention. One of these is a 10-inch high-production precision manufacturing lathe with turret equipped to operate high-speed air drills in two of its six stations. Basically a high-speed production machine capable of handling smaller work in quantity, the new machine has been designed to take a considerable variety of tooling. Other equipment, in addition to air drills, includes an air-operated bar feed attachment and multiple positive stops.

The other machine is Monarch's new Speedi-Matic highproduction Hand Screw Machine, equipped with an automatic electronic system for selecting and controlling speeds and feeds. Thus, it is a simple matter to set up as many as nine different speeds and six different feeds for each job, depending on the requirements of the succeeding operations. Of particular interest is the fact that both speed and feed remain practically constant, as set, regardless of load variations.

New developments and improvements in electrical equipment for machine tools, designed to meet industry's demand for higher output, faster production time, reduced operator fatigue and greater precision on finished products, will be exhibited by the RELIANCE ELECTRIC & ENGINEER-ING COMPANY, Cleveland, Ohio. The company plans to unwrap, for inspection by attending key manufacturing executives, its new "Precisioneered Line" of squirrel-cage A.C. Motors for machine tool drives.

Co-featured in the Reliance exhibit (booth No. 302-C) will be the all electric V\*S Drive System, a compactly arranged and completely packaged electrical transmission system for machine tool operation. This drive provides adjustable speeds from A.C. circuits, stepless speed changes on an infinite range, smooth acceleration and deceleration, and other vital functions.

To dramatize the V\*S Drive System, a basic display will be utilized in demonstrating the application of both rotating and electronic type systems to machine tools. How the unlimited flexibility of equipment operation, ease of control and other significant advantages provided by both types contribute importantly to greater precision and productivity, with less worker fatigue, also will be shown. A brand new product by the GEOMETRIC TOOL COM-ANY, New Haven, Ct., will have its premier showing in the impany's exhibit (Booth No. 50) at the Show. This is the cometric "Supermetric Chasers" which, as the name im-

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plies, have been created to meet the demand for greater accuracy and improved performance in thread cutting.

Months of development, by Geometric has resulted in what is said to be a completely new manufacturing process whereby it is possible to work to closer limits and to maintain precise uniformity of

product. Through the improved uniformity of these chasers, which have ground threads, fewer adjustments are required when changing from one set of chasers to another; thus, down-time is considerably reduced.

Included in the Geometric exhibit will be the more improved Geometric Style DS Convertible Self-Opening Die



Head. All of the popular features of the previous Style DS models have been retained in this new improved series, and many new features have been added. The new model is practically four heads in one. Both of these developments—as well as other displays by Geometric—

embody marked advances in thread cutting and should be closely investigated by production executives concerned with screw products.

The CINCINNATI SHAPER COMPANY, Cincinnati, Ohio, (Booth No. 417) will show three distinct lines of machines—Cincinnati Shapers, Press Brakes, and Squaring Shears. All machines in the company's lines will be under power and performing a variety of work as near to actual shop working conditions as possible.

Shown will be several Shapers with different types of tables, heads and other accessories, with demonstrations on heavy cutting, high speed cutting, and other interesting operations that are peculiarly adapted to a shaper. Among these tools will be a 24" Heavy Duty Shaper with universal table.

The Press Brake line will be represented by a 130 Series,  $^3\mathrm{s}''$  capacity Press Brake and a 50 Series, 10 gauge capacity machine. While Cincinnati Press Brakes have been in production for some time, this will be the first time that they will be exhibited at a Show. They will be shown performing notching, forming, and bending operations and, since these machines are extremely versatile, the shapes produced during demonstration will promise to arouse considerable interest. This also holds for the Squaring Shears, which will be shown performing typical as well as unusual operations.

A new adjustable-speed Tri-Clad Induction Motor, a new feed-traverse Gear-Motor drive, and a new inductor frequency Converter will highlight GENERAL ELECTRIC'S exhibit at the Show. Also on display will be machine-tool transformers, plugging switches, oil-tight push-button units, a new electronic positioning control system, and the latest in G-E relays and Switchettes.

The new Tri-Clad motor is available in ratings from 3 to 50 hp, and features infinitely adjustable speed over a 3:1 ratio by simply turning a dial. The entire unit, with the exception of the starter control, is self-contained in a housing only a little larger than a constant-speed motor of a comparable size.

Two new machines, by the CLEVELAND AUTOMATIC MACHINE COMPANY, Cincinnati, Ohio, will be displayed for the first time at the company's exhibit, booth No. 510. One is the new Cleveland 2½" Single Spindle Automatic Turret Machine, known as the Dialmatic Cleveland Model AB. The Dialmatic feature of this machine is an electric tool feed drive which makes independent, infinitely variable forward and return tool feeds possible, without cam changes, for each of five tool positions in the turret head.

Another important development, in the new Model AB, is that it can be quickly converted from bar to chucking work, or vice versa. The machine can also be furnished with a hand or automatically operated air valve for the control of the spindle chuck.

Furthermore, if the shape and size of the work piece permits automatic loading, a hopper type magazine can be provided; also, if hand-loading of irregular castings is required, the spindle motor can be provided with a stopping device so that the work can be loaded into the work spindle.

The second new Cleveland machine to be exhibited is the Model 200 High-Pressure Hydraulic Die Casting Machine. The machine is designed for fast, economical die casting, having smaller over-all dimensions than the widely used Cleveland Model 400 machine. The Model 200 is capable of locking dies with tremendous pressure to produce castings with a minimum of flash, and with strength to resist stretch, distortion or breakage. Both the Model 400 and new Model 200 Cleveland Die Casting Machines will be in operation.

A broad line of Hydraulic and Pneumatic power and production equipment will be exhibited by HANNIFIN COR-PORATION, Chicago. In addition to being a display of the company's line, the exhibit is intended to be educational and instructive in the newest and most modern production methods. To that end, Hannifin Corporation has taken a block of show spaces, designated as Booth 411, and will have working displays in operation during the entire Show.

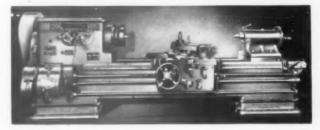
The exhibit will include a 25-ton Hydraulic Straightening Press, such as is used in the manufacture of crankshafts, axles, lathe spindles and other parts that may be machined, heat treated, and then straightened prior to grinding. Also a 5-ton Bench Type Hydraulic Press, designed to replace older hand powered devices for high speed press assembly, punching, piercing, and similar work in production lines.

Also shown will be a 12½-ton Utility Press, a 35-ton portable Hydraulic Riveter, a 17½-ton portable Hydraulic Punch, a Hydraulic Multiple Piercing Unit and—of particular interest—the Hannifin "Hy-Power" Pressure Generator,

an ingenious unit used to power Hannifin riveters, shears, and yoke type presses. Starting with low pressure, this builds up immediately on meeting resistance and then exerts tremendous pressure at maximum power demand.

The Hydratrol Lathe, by Lehmann Machine Company, St. Louis, Mo. The small photo shows the interior of the ingeniously engineered head-







DoAll GH-1 Handraulic Surface Grinder.

Due to space limitations at the Dodge Chicago plant, the DoALL COMPANY will conduct two exhibits; one, taking up almost 700 square feet in Booth No. 37 at the Show, will show cutting tools, while 3000 square feet, at the company's plant in Des Plaines, Ill., will contain machine tools.

Free transportation will be provided for visitors who wish to attend the Machine Exhibit at the plant, and busses and trains will be available from the Dodge-Chicago plant or from the Chicago loop. Visitors to the Des Plaines plant will receive personally conducted tours through the machine tool exhibit, which will consist of 1948 models of the following tools:

Sawing machines; bench filers; band filers; lathes; screw machines; milling machines; profilers; surface grinders; tool grinders; machine tool accessories and attachments; heat treating units; punch presses; precision measuring equipment; and butt and spot welders.

These machine tools and accessories will be in operation, so that visitors may witness their performance in shaping all types of materials. Included in the program will be motion picture research films and lectures on sawing techniques, and visitors will be afforded every opportunity to become fully conversant with the operation and possibilities of these machines. In all, the DoALL exhibit will feature the following four developments:

The company's development of a new low-cost, all-purpose sawing machine, capable of both friction and conventional speed sawing. This machine promises to be of particular interest to small companies in woodworking, plastics, foundry and sheet metal shops. In another direction is a small unit for the precision measuring and segregation of production parts as a rapid means of maintaining quality control in plant production.

In the field of hydraulics, a new hand-operated surface grinder which employs hydraulics as a "lift" to its hand operation. This principle makes the machine extremely easy to operate in tool and die shops; in addition, crush grinding has been developed as an added feature of the DoALL Production Surface Grinder. Then, in the field of power controls, visitors will have opportunity to see nine different models and sizes of Variable Speed Pulleys, all applicable not only to machine tools but to all types of machinery requiring control of speed. In all, the two exhibits will be unusually comprehensive and will afford diversion as well as education.

One of the very interesting exhibits will be that of the GISHOLT MACHINE COMPANY, Madison, Wis., who will show in Space No. 304. Taking in some 15,000 sq. ft. of space, the company's entire line will be in operation with representative work pieces produced by each under simulated shop conditions.

The Gisholt line, comprising 30 or more tools of ultramodern design, will include Universal Raw type and Saddle Type Turret Lathes, Hydraulic Automatic Lathes, Fast matics, and a Turn Milling Machine which simultaneous machines and furnishes all of the cheeks and pins of automotive crankshaft to a finish for grinding.

Also shown will be the Gisholt Superfinishers, a Sta Balancing Machine and, perhaps of particular interest, for Gisholt Dynetric balancing machines. The latter machine of which a previous model was widely publicized, he attracted wide attention and is a conceded cost cutter the automatic balancing of automotive crankshafts.

Occupying Booth 666, the exhibit by SKF INDUSTRIES INC., will highlight the important part played by antifriction equipment in machine tools, will feature cut-away models of precision bearings, mountings on machine spindles and—of particular interest—the first public showing of an Oil Mist Lubricator designed to greatly lengthen the life of spindle bearings.

According to tests, the Oil Mist Lubricator—developed by SKF—extends the average life of grinding spindle bearings from several hundred to as much as several thousand hours of operation and results in savings in lubricants up to 90 per cent. Several drops of oil per hour will lubricate a medium size ball bearing operating at moderately high speed.

Obviously the exhibits previewed here are but a few out of many. We can't cover them all in this writing; however, the tools described and illustrated here are typical of the general run of exhibits. At any rate, an exposition of tools of such magnitude, and of such vital importance to industry, warrants the attendance of every industrial executive who can possibly get away from his work. As previously implied, attendance at this Show will be an entirely worthwhile endeavor and a highly profitable investment if only for the ideas it will inspire.

In passing, we might mention that THE TOOL ENGINEER will also have a booth at the Show—No. 35-I—and ASTE members as well as our many friends throughout the industrial and engineering worlds are cordially invited to drop in for a rest and a visit. Our display, while modest, will give indication of why THE TOOL ENGINEER has zoomed into the first division in the technical publications field.

One hundred Exhibitors and many thousands of Production executives are expected to attend THE PRODUCTION AND MACHINE TOOL SHOW which will be held coincidentally with the N.M.T.B.A. Show, Chicago, from Sept. 17th to 26th inclusive. The site of this show is the famous International Amphitheatre located at 43rd and Halsted, just 3½ miles from the loop. Not to be confused with the Machine Tool Show, THE PRODUCTION AND MACHINE TOOL SHOW is composed of independent exhibitors, American and foreign and, it is said, by a number of members of the Nat'l Machine Tool Builders Association.

Visitors at the PRODUCTION AND MACHINE TOOL SHOW will see many of the finest production and machine tools built in the world. Among the machines on exhibit will be the latest in lathes, drill presses, punch presses, grinding machines, hand sawing and filing machines, milling machines, electric arc welders, die casting machines, profile grinders and scores of other machine tools and accessories.

According to show officials, the International Amphitheatre—which is an exposition hall—is believed to be one of the best exhibition sites in the midwest, being fully equipped with all facilities necessary for the demonstration of machines in operation.

The PRODUCTION AND MACHINE TOOL SHOW will be open from 10 A.M. until 9:30 P.M. daily except Sunday, Sept. 21st. Admission will be by registration only.

## Why Sapphire?

A New Engineering Material, Sapphire Provides New Tools for the Tool Engineer

CONSIDERING the many and enthusiastic claims made a hich, fortunately, are valid), the editors of *The Tool Engineer* are inclined to close investigations of "whys" and "hows" before releasing articles expounding their virtues. This somewhat cautious approach, which is not to be construed as ultra-conservatism since it is inspired by a feeling of responsibility to our readers, applies equally to manufactured sapphire—or, as it is becoming known, Industrial Sapphire.

The development of this super-hard material, with its broadening application to industrial uses, has been watched with lively interest the past several years. Yet, while short editorial comments have been released from time to time, we have refrained from publishing a general article until the facts had been established, to our complete satisfaction, by personal investigation and a visit to the plant of the Sapphire Products Division of the Elgin National Watch Company,

in Aurora, Ill.

#### Tested Over A Century

The fact of sapphires needed no verification. In common with other precious and semi-precious stones—as the ruby for example—natural sapphires have been used for a century or more for bearings and wear surfaces in fine watches and precision instruments. In such applications, sapphires have given year in and year out service, often performing under conditions that would curl the hair of the machine designer of average experience.

An example is the common electric meter (which is the power company's policeman in every modern home), where the bearings are sealed in for ten years of trouble-free service, whether it be continuous or intermittent. Lubricants, with possible acid content, can't corrode the sapphire bearings, and in ten years the lubricant may evaporate entirely. But lubricated or not, the bearings continue to function day by day, every day. They never seize, gall, or drag on the metal mating part—and, regardless of lubrication, there is probably few if any other practical combination of materials with a lower co-efficient of friction than steel on sapphire.

Another example of sapphire service is that of the pallet stone action against the escape wheel of a watch—the same mechanism, incidentally, that functioned in grandfather's "turnip". Here, the power from the mainspring is delivered to the hairspring in 432,000 impulses per day. Yet, the sapphire pallet stones in the transmission do not only resist wear themselves, but the several hundred thousand rubbing-pushes on the teeth of the steel escape wheel burnish and



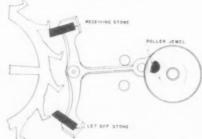
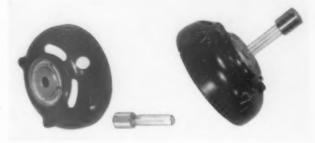


Diagram of watch escapement showing Sapphire parts. The energy from the mainspring is transmitted by a rubbing-push, on the Sapphire pallet stones, 432,000 times each 24 hours.



The rotating Sapphire tool sizes powder-metal bearings and imparts a high surface finish.

harden their surfaces so that they, too, do not wear appreciably in a lifetime of service.

Entirely aside from such uses, natural sapphires had been applied to industrial uses several decades ago. The writer, for one, used sapphires for finish boring of non-ferrous metals about 35 years ago, and even used them for finish turning of delicate, semi-hard steel parts for fine instruments, and with considerable success. A combination of high speed and fine feed produced a surface finish that required only subsequent polishing with crocus and rouge to obtain a mirror surface.

In view of all this, the mooted point was: Would the manufactured product compare favorably, in general wearing qualities and resistance to shock impact, with the natural sapphires? In the writer's belief, that question has been satisfactorily answered. Not only that, but it is evident that, for industrial uses at least, the manufactured sapphire has many points of superiority over the natural.

#### Sapphire Is Consistent

It is a known fact that natural stones, from semi-precious to diamonds, are not consistent in hardness or quality. On the other hand, it may be assumed—if not taken for granted—that, whether superior or inferior to natural materials, synthetics can be made consistent in quality once a manufacturing process has been arrived at and standardized. That is, quality will be standardized and applications may then be based on a known quantity.

At this point, a review of the progress of this material, which has been man-made as corundum (the generic name for manufactured sapphire) for almost a half century. Until recently, corundum has been almost exclusively a European product; however, six years of commercial manufacture in this country have already produced material larger and in a variety of forms not previously known. Fabricating methods have been revolutionized, while special machines and hand methods have been replaced by modified standard machine teels.

Quality and consistency of manufactured sapphires are now established beyond all question. And, according to Roger Waindle, works manager of the Sapphire Products Division, severe tests over a period of years, in direct comparison with natural stones, have proven them not only equal to the latter but, in many instances, superior. Certainly the manufactured sapphires lend themselves to applications entirely beyond even the remotest possibilities of the natural.

With the development of larger sapphire raw material, and the adaption of standard machinery to its fabrication, the



Standard machining operations. This has led to marked economies in fabricating Sapphire tools and machine parts.

lessons learned in instrument work are being interpolated into every-day industrial tools and machine parts. The war, for one thing, brought the Sapphire Plug and Ring Gage, which usually outwore other materials—including tungsten carbide—by several hundredfold and, in some cases, by a thousandfold.

As a consequence of proved wearing qualities, many of America's manufacturers of precision gages and semi-automatic, high-production measuring instruments employ sapphire at the wear points or where the gage must contact parts in process of inspection. Micrometers, with anvil and spindle tipped with sapphire, are already stock items with at least two producers. In addition to wear resistance, its usefulness in gaging stems from its high resistance to deformation and its non-porous, monocrystalline structure, which does not mar surfaces against which it is used.

Another factor, in the choice of sapphire for wear surfaces, is its remarkably lower costs as compared to diamonds. Hence, sapphire is replacing diamond gaging points in many instances. Not entirely because of cost, since gage makers would employ the best material regardless of a cost difference, nor because sapphire is more wear resistant—the diamond, of course, is the hardest substance known—but because manufactured sapphire has a uniformity not matched by the average industrial diamond usually applied to gaging.

#### Bonded to Hardened Steel

Another consideration in its favor is that, while comparatively small diamonds must necessarily be mounted in soft material, the sapphire may be bonded to hardened steel. At but a fraction of diamond cost, then, a larger, more generous contact area may be provided and, in many instances, with the added advantage of closely standardized replacement parts should the original by any chance be damaged.

In passing from gage applications, another feature of this material—stability—should be mentioned. A natural, very stable oxide, sapphire apparently goes through no phase changes, nor does it otherwise change dimensionally, as may happen in time, to even our finest measuring tools, the precision gage blocks. Not that there is any immediate possibility that sapphire will replace steel as a material for gage blocks.

Fractional microinch finishes are not difficult in the monocrystalline, hard sapphire. Cutting tools of sapphire, used for burnish cutting of soft metals, have lately opened the eyes of plastic finishers where the high surface finish of a properly designed tool has been imparted, in like, to the plastic surface. Design, perhaps as much as anything else, is a factor that will have to be worked out in the present state of knowledge of this bewhiskered "newcomer" (?) to the cutting tool field.

The growing use of powder-metal sleeve bearings already created a necessity for sapphire in burnish sizi. Rotated within bearing bores, for instance, highly polisi apphire burnishers straighten and polish simultaneous without closing the pores of the spongy metal. Conting burnishing, with formed sapphire tools, is another application of this versatile material.

With regard to actual machine tool parts, tests instituted more than a year ago have shown that sapphire sleeve beings (of which sizes up to ½"—and even larger—are now prospect) have a longer life than the so-termed anti-frictionally bearings which they replaced. The sapphire bearings have burnished, rather than worn the shafts, so that there has been no appreciable run-out or play to date,

#### Low Coefficient of Friction

While this statement may arouse some skepticism, the fact is that, due to the low friction coefficient, the solid sapphire sleeve bearings actually generate less heat than conventional bearings. This has been proved time and again by exhaustive tests conducted by the Sapphire Products Division. As further corroboration, Wm. Klemm-whose article "A New Evaluation of Surface Finishes", in June 1945 The Tool Engineer, aroused considerable interest—has demonstrated that very hard steel shafts, having zero finish-i.e., ± .000 microinch-and running in hardened bushings also having zero finish, will run cool even though not lubricated. Even allowing for possible exaggeration and over-enthusiasm, the fact remains that sapphire-or any manufactured material having similar hardness and crystalline qualities-may open possibilities for ultra-high spindle speeds far beyond immediate. practical concepts.

In line with growing, practical applications, sapphire is used to tip or face precision lathe and grinding centers—and here, wear resistance and low friction coefficient are its most outstanding characteristics. Balls of sapphire are used in high temperaty—and corrosion resisting bearing applications, sometimes as complete bearings, often as parts of bearings employing both metallic and sapphire races. Balls are also used in fine gage points, in many styli or marking devices as contact points, and in check valves where hardness and resistance to corrosion are important considerations.

Because of its wear resistance, and also because it is not affected by fluxes nor accumulates metallic beads of flash from welding, it is being applied to welding and soldering fixtures. Its high dielectric strength seems to have the quality of improving the heating efficiency of resistance welding operations.

In the electrical field, sapphire is finding many uses. Mechanical applications include winding guides and dies

Miscellaneous Sapphire tools include gages, hones, burnishing tools, rods, "boule", thread guides, cutting tools and vee blocks among others.



nich are extensively used for minute, abrasive filament aterials such as tungsten alloy; for winding enameled wire here protection of the thin enamel insulator is most imporant; for wiping dies for tinning, and otherwise controlling he coating on wire; also, for braiding, winding and straightning guides. For such applications, its high dielectric trength and complete surface non-porosity are important onsiderations—especially so for insulators and insulants.

Other applicaons include saw unides, where sapphire is said to lave outworn all other materials, especially in such instances as where multiple saw assemblies are used, and where direction of saw travel must be changed. Also, spray nozzles of this material are used for flash drying, as in spray coating and in chemical processing orifices.



Micrometers are typical of standard stock tools featuring Sapphire on wearing surfaces.

One of the drawbacks to the more extensive application of sapphire, to date, has been in the bonding—that is, in making sapphire-metal composites or in attaching the material to metal surfaces at wear points. It so happens that its surfaces is impervious to fluxes and the common methods for effecting metal bonds. However, researchers have now perfected a means of metallizing sapphire so that it can be bonded to itself, and to metals, much the same as in the case of the metallic matrix cemented carbides. As a consequence, many new applications are opening, with new tools and products being prepared for the market.

As we know, the most difficult hurdle, when introducing a new material to the engineer, is that of placing it at his disposal in forms that are readily usable. With metal bonding, the designer can now put sapphire into his product by the same means used with the more familiar carbides. Even with metal bonding, however, there was the problem that, while diamond abrasive equipment now used in most plants for cutting the hard carbides can, fortunately, be used in all cutting and rough forming of sapphire, the high finish which is a characteristic of the material could not be obtained so easily. Now, however, when a manufacturer desires to finish sapphire in his own plant, this can be accomplished by use of newly introduced diamond abrasive compound systems such as Hyprez.

#### And Now, Sapphire Tool Bits

Now, coming back to sapphire as a cutting material. When, in conversation with Mr. Waindle, the writer mentioned its application to boring and turning, the former expressed some doubt regarding its immediate possibilities in this direction. At the writer's request, however, and as a result of suggestions accepted by the company's development engineer, Mr. G. S. Peck, Mr. Waindle consented to make test runs on brass test pieces.

This was done, and while it may be "jumping the gun" to mention this phase of application at this time, it must be said that the results were rather surprising. A half-inch brass rod was progressively turned, in steps, from about 7/16" down to a bare 32nd, each in one pass and each to a surface finish comparable to glass in smoothness. If further tests establish the material as practical for boring and turning we may look forward to shaped sapphire cutting tips. In any event, the sapphire is a new engineering material; a new tool in the hands of the designer and the tool engineer.

### Rotor Housings Speeded by Special Drill Press

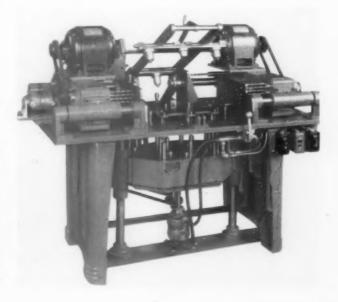
I NSTALLATION OF A SPECIALLY designed stanax-Campbell Multiple Drill Press has greatly speeded production of the Rotoflo Power Lawn Mower for the R.P.M. Manufacturing Company, Kansas City, Mo. In 60 seconds, the new drill press drills 30 holes simultaneously in the 22" x 24" x 434" cast aluminum housing which covers the horizontal revolving cutting blade. The same operation required twice as much time with previous equipment.

Six holes are bored in the housing from either side, the remainder being drilled upward from the bottom of the press by three separate multi-drill units. Two of these units operate in a horizonal position, one on each side of the casting. The third unit operates in an inverted position to facilitate easier locating of the casting, faster loading and unloading, and better chip disposal.

By closing one simple handoperated cam lever, the rotor casting is centralized located sidewise (left to right), and held in rigid drilling position. The clamp is counter-balanced to stay in an open position during loading and unloading.

All drills run at their required speed through proper gear ratio between spindles, and operate through master guide bushing plates for constant accuracy. The drill units are operated by individual air feeds with the air cylinders synchronized to operate from one master valve.

The new equipment was designed and developed by Stanax-Campbell Co., 313 North Lake St., Burbank, Calif.



## Production Tooling with Carbides

A new Carbide Tooling Technique up metal cutting beyond previous attainments

Tool. Engineers who design multiple tool set-ups for machining gear blanks, axles and other high production parts are now giving more thought to the problems of resetting and regrinding of tools. Fig. 1 shows a typical example of the first roughing operation on an automotive cluster gear tooled with single-point carbide tools. To remove all 10 tools for regrinding and to replace them with a sharp set is no small job since the diameters and over-all length must be held to within .010". To regrind the 10 tipped tools likewise takes time and is an expensive operation.

To overcome these difficulties, a new carbide tooling technique, developed during the war by Kennametal engineers, has been employed by several automotive plants. After one year of steady production on gear blanks, stem pinions, other steel forgings and cast iron gear cases, flywheels, and cam shafts, the saving in set-up time, tool regrinding cost, and tool cost per piece machined has been outstanding. It may therefore be expected that tooling of this general character will have widespread use throughout the country.

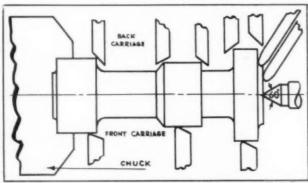


FIG. 1. Typical tool layout for roughing operation on transmission cluster gear forging.

A tool of this type (Fig. 2) was developed early in 1945 to finish turn 155 mm. HE shells. The shells were heat treated after rough turning, leaving a light scale to be removed in the finish turning operation. The shells had to be turned to close tolerances and multiple tool cuts had to blend without any indication of a step. The scaly surface

FIG. 2. The original Kennametal cylindrical ("solid round") turning tool, used to turn 155 mm, HE shells. Its performance was outstanding.



caused rapid tool wear, necessitating frequent tool changes with a high percentage of scrapped shells due to the difficulty of setting tools within diameter tolerance and blending the cuts satisfactorily.

The "solid round" tool, which replaced the conventional turning tools, consisted of a ½" diameter cylinder of Kennametal K3H, ½" long, clamped as shown in Fig. 2, and tilted 7° for clearance. When the insert tool dulled, it was indexed by loosening the Allen screw and rotating the insert about 30° without disturbing the location of the tool

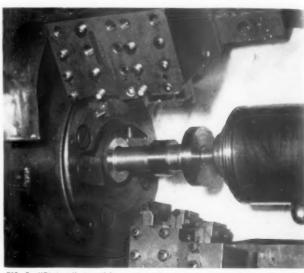
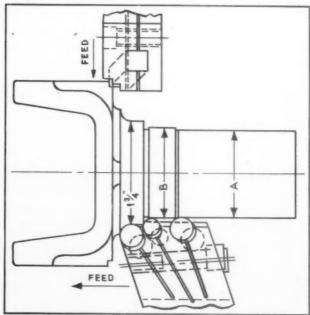


FIG. 3. "Birdseye" view of 1st rough turning operation on transmission cluster gear using Kennametal cylindrical insert type tools on 16" Fay Automatic Lathe.

in the block. After 10 runs on one end, the cylinder was turned end for end and an additional 10 runs were made on the other end. After 20 runs, the dull cylinder was replaced with one that had been reground, and the process continued without ever disturbing size or blend of the cut. Regrinding the cylinder after 20 runs was less costly than regrinding a shank-type tool after one run; furthermore, cracked carbide—so-common to brazed tipped tools in regrinding—was completely eliminated.

The ½" dia. x 1½" long cylinder of K3H carbide turned a total of 2835 shells at a total tool cost of \$.0026 per

FIG. 4. Roughing and finishing front universal joint slip yoke in one set-up, using Kennametal cylindrical inserts for the turning operation, front tool slide. Plunge cut on hub diameter rear tool slide, is done with Kennametal square inserts. Operating and performance data are given in Table II.



#### TABLE I -- PERFORMANCE DATA ON TRANSMISSION CLUSTER GEAR

	ROUGHING	SEMI-FINISHING	FINISHING
WORKPIECE: OPERATION:	Cluster Gear, SAE 1040 Steel Rough turn and face 334", 234", and 158" diameters		Same Finish face ends, finish turn 3¾", 2½", and 2¼" diameters, chamfer corners
MACHINE: TOOLS:	16" Fay Automatic Lathe, 40 HP Five K3H solid rounds, and three KM tipped tools	12" Fay Automatic, 40 HP Four K3H solid rounds, and three KM tipped tools	12" Fay Automatic, 25 HP
SPEED DEPTH OF CUT: FEED:	391 RPM, 165 to 384 SFM Up to 1/4" .024"	364 RPM, 155 to 290 SFM Up to 3/16"	364 RPM, 143 to 357 SFM 1/32"
RESULTS:	200 gears per solid round tip index (450 pieces per grind on tipped tools) 5 indexes per end	350 gears per solid round tip index (450-600 pieces per grind, tipped tools) 8 indexes per end	300 gears per tip index 6 indexes per end
	2000 gears per double end grind 8 regrinds 16,000 pieces per tip life	5600 gears per double end grind 16 regrinds 89.600 pieces per tip life	3600 gears per double end grind 16 regrinds 57,600 gears per tip life
TIME: PRODUCTION	20 seconds 1200 pieces per shift, two machines, one operator	17 seconds Same	18 seconds Same

shell, compared with 93 shells turned with a  $1\frac{1}{2}$ " square-shank tipped tool at a cost of \$.063 per shell—twenty-four times the cost of using the cylindrical tool!

In April, 1946, the transmission cluster gear shown in Fig. 1 was tooled with solid round tools on rough, semi-finish, and finish turning operations. Fig. 3 is a view (looking down) of the roughing operation while Table 1 gives a tabulation of the performance of the solid round tools.

More than a year of continuous operation on these gears has established a number of advantages for the cylindrical type tool. These are briefly outlined in following paragraphs.

Indexing or turning the cylinder, when dull, drastically reduces down-time for tool adjustments. When replacing a cylinder that is dull on both ends, it is only necessary to turn the back-up screw until the cylinder is flush with the top of the holder to bring it to size. High production rates were maintained without delays due to tool trouble.

Tool grinding costs have been greatly reduced. With an average of 12 runs per grind instead of one, it would appear that grinding time has been reduced to 1/12 of what it was originally. Actually, a much greater saving results from the fact that the grinding has been simplified by elimination of brazing to a steel shank. Clearances and contour of the tool are not affected by regrinding since only the ends of the cylinder are reground. Ends are roughed in a V block, on a conventional carbide tool grinder, and rotated in a collet to grind the chip breaker—both operations on two ends of the insert requiring less time than conventional grinding of a tipped tool.

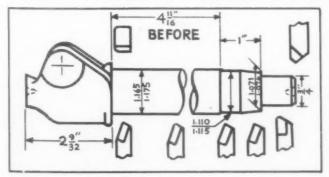
Consistent tool life has been a noticeable advantage of the cylindrical tool. So often, carbide tools give good performance under close grinding supervision, but give inconsistent runs between grinds if grindings not carefully watched. With cylindrical tools, control of clearance is in the holder and the contour is the radius of the cylinder. Regrinding the ends does not affect either of these factors, thus taking much of the human element out of grinding.

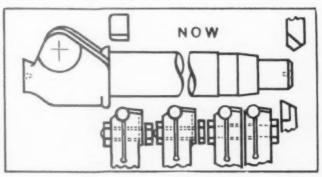
Then too, elimination of brazing to a steel shank avoids thermal strains which often cause cracks and inconsistent tool life. Another factor, contributing to consistent tool life, is the combination of large radius and negative rake (inherent in this tool) which makes it adaptable to severe, interrupted turning and facing operations.

Other examples of high production automotive parts on which cylindrical tools have been employed are shown in Figs. 4 and 5.

	BEFORE	NOW
WORKPIECE:	Slip Yoke, Front Universal Joint; 4 3/16" long; 1145 rough forging	Same
OPERATION:	Turn A, B, and 134" diameters. Plunge cut on hub diameters, 2 15/16"	
MACHINE:	Sundstrand 12 x 22	Same
TOOLS:		Kennametal (K3H) SR and SS Inserts
FEED:	.010"	.010"
SPEED:	600 RPM, 250 to 460 SFM	600 RPM, 250 to 460 SFM
DEPTH OF CUT:	Up to .075"	Up to .075"
MACHINING TIME:	Sp 10 10.0	Same
PRODUCTION:		Increase, due to scrap reduction and sav- ings in set-up time
PIECES PER GRIND	150 to 200	13,600 (1,700 per cor- ner, 6,800 per end)
PIECES PER GRIND	250	2,000 (350 per index 1,000 per end)

FIG. 5. Rough machining Pitman shaft. At left, machining the part with conventional K3H tipped tools. At right, the same operation performed with Kennametal cylindrical inserts. Conventional tools used for squaring and chamfering. The before and after performance data are shown in Table III.





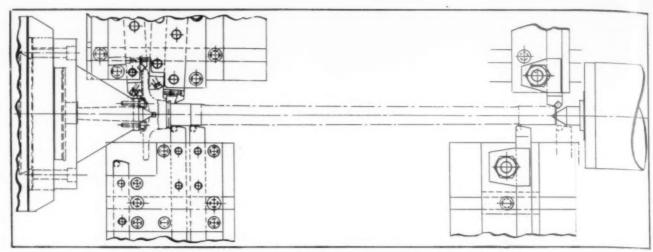


FIG. 6 Machining automotive rear axle shaft on Snyder axle lathe, using Kennametal insert type tools.

The success of the cylindrical tool led promptly to the use of other insert shapes where cylinders could not be employed. Tools with triangular inserts have been used to cut to a shoulder or for plunge feeding on turning operations. The triangular tool is suitable on small diameter shafts where cylindrical tools may chatter. Inserts with square section have been used on turning, facing, and shallow grooving operations. Cylinders with four or more flats provide economical chamfering tools, and can also be grooved to provide internal radius tools for rounding corners. One such insert, 1½" long with 4 grooves, equals 50 or more expensive internal radius tipped tools.

Fig. 6 shows various forms being used in machining an automobile rear axle. Diameters are turned with cylindrical tools at .024 feed, while the flange is faced on both sides with triangular inserts. Flange and spline end are chamfered with cylindrical inserts having four flats as shown. The formed insert in Tool A grooves the rough forging as shown, and faces and forms a radius on the shoulder. While this tool cannot be indexed, it has all other advantages of the insert-type tools, which makes it more rugged and less expensive than a brazed form tool.

While the examples mentioned in this article illustrate the application of carbide inserts to multiple tool set-ups, it is not intended to give the impression that their use stops at that point. Unusually great savings have already been achieved in industry by the use of vertical insert tools on single-tool jobs, such as planers, shapers, and engine lathes, where severe interrupted cuts are encountered. The vertical insert tool has been valuable to the small shop not equipped to properly grind conventional carbide tipped tools.

## Mr. I. F. Holland, 1st Vice Pres., ASTE Dear Mr. Holland:

I am writing a series of articles on "Drawing Methods and Formulae" that is now appearing in "The Tool Engineer". The editorial staff for this publication is doing a commendable job of re-editing proof-reading and layout. Previously I have written articles for other publications and am coauthor of the book "Simplified Punch and Diemaking", published by Macmillan in 1945. I think "The Tool Engineer" is not only the neatest magazine of its type but among the best laid out in the technical publications field. My opinion is shared by many interested readers.

Tremendous progress has been made by your staff and our editorial staff and congratulations are certainly in order. I think ASTE is definitely slated to be one of the soundest organizations in the country. I am hoping for our continued success.

JAMES WALKER

	BEFORE	NOW
WORKPIECE:	Pitman shaft; SAE 1340; 245 to 281 BRN	Same
OPERATION: Rough turn shank, fin- ish turn taper and thread diameter		
MACHINE:	Sundstrand Lathe, 15 HP	Same
TOOLS:	Kennametal tipped tools (K3H)	Kennametal
FEED—FRONT HD: BACK HD:		.018"
DEPTH OF CUT: SPEED:	1/8" to 3/16" 800 RPM, 155 to 240 SFM	1/8" to 3/16"
MACHINING TIME:		*****
FLOOR TO FLOOR: MACHINING	.37	.32
CYCLE: PRODUCTION/	.20	.17
HOUR:	162 gross, 132 net	175 gross, 135 net
PIECES/GRIMD:	250 average	2800 (350 per index, 4 indexes per end)
PIECES/TOOL:	2000 average for 6 months	

All of these various types of vertically-clamped carbide tools will be demonstrated at the N.M.T.B.A. Show and can be seen in use at the following exhibits: Sundstrand Machine Tool Co., Booth No. 20; the Jones & Lamson display of Fay Automatic Lathes, Booth No. 326; and Kennametal, Inc., Booth No. 570.

#### Mr. A. E. Rylander

Technical Editor, The Tool Engineer

#### Dear Mr. Rylander:

Thank you for you steer of July 7th with which was enclosed tear sheets on the Symposium on Gears.

We certainly appreciate very much your courtesy in securing a set of these papers as we know that the number available must be quite limited. Such a comprehensive set of publications on the subject of gears is of value to us inasmuch as we manufacture the gears which are used in our machine tools.

#### CLYDE M. GRIFFIN, Director of Research THE LODGE & SHIPLEY COMPANY

The letters published above are typical of many received from contributors, industrial executives, and readers.

THE EDITORS

## Cost Cutting With Production Grinders

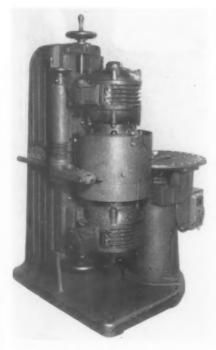
Grinding of parts, from the rough, has become one of the "musts" in modern manufacturing

O VER A PERIOD OF YEARS, production griating machines —wet and dry, and disc—have gradually superseded other metal cutting machines for the production of parts having one-side or two-side finished surfaces. While the old-style emery cloth faced disc grinders, with their swing or fixed tables, are still used to some extent, they are rapidly giving way to modern tools such as that shown in Fig. 1.

These modern disc grinders are provided with long wearing, thick abrasive facings and, being equipped with lever operated tables and slides, are precision tools to all practical



FIG. 1. No. 5-18-L Besly direct motor driven, Single-Spindle Disc Grinder, a standard machine for light manufacturing or tool work. FIG. 2. No. 902-12" Besly Double-Vertical Spindle Dry Grinder, with rotary feed, tooled for grinding both ends of small coil springs. Operator feeds workpieces into openings in the rotary table; after grinding, springs fall into a receptacle.



purposes, lending themselves to a wide variety of workpieces that must be mass produced. These machines are also admirably suited for toolroom work, especially for such operations as facing or squaring dies and fixture components.

In direct contrast to the comparatively simple machine shown in Fig. 1, is the highly developed double vertical grinder shown in Fig. 2. This machine, which has opposed, adjustable vertical spindles and a rotary table, is designed for continuous grinding, the operator merely loading and unloading the work pieces as the fixtures (when used) pass before him. The machine shown is "tooled" for simultaneous grinding on both ends of coil springs, the "fixtures" in this case consisting merely of equally spaced holes in the revolving table.

Yet another vertical grinder but on a grander scale, is shown in Fig. 3.

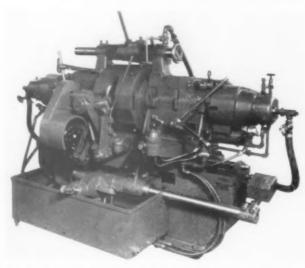


FIG. 3. No. 372-53" Besly Vertical-Spindle Wet Grinder, with rotary feed. Operator places castings in fixture and removes them after they have been ground.

Like the smaller tool shown in Fig. 2, this machine has a rotary feed table, is designed for continuous grinding, and is shown tooled to grind cast iron gear covers. The operator merely loads and unloads the workpieces, which are ground flat and

true on the face at the rate of 250 pieces per hour. And that's high production!

Having followed the progressive developments from Fig. 1 to Fig. 3, it becomes apparent that these productive grinders are machine tools in every sense of the word. That is, they are designed for metal cutting, just as lathes, millers, and planers, to name three of many, are

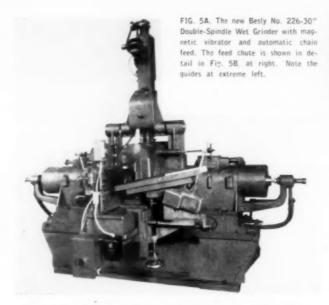




FIG. 4A. Besly No. 218-20" Double-Spindle Wet Grinder, with rotary fixture. Side driving rolls rotate work while being ground. Fig. 4B, above.



September, 1947



That they also function as a turning tool (comparable to a lathe) may be seen by referring to Fig. 4A where a double wet grinder is tooled to face both sides of circular saw blanks. The machine shown, which may be applied to a wide variety of circular parts—as, for example, chuck discs, valve discs, and so on—is ingeniously engineered for close reproduction of work and long life for the tool itself.

As in the case of the tools previously described, the operator has only to load and unload the work, which is placed on the arbor (detail, Fig. 4B), and then rotated between the opposed grinding wheels. The workpiece is rotated on the arbor by means of the two small side driving rolls, and fed into the grinding wheels by means of hydraulic feed. Output is at the rate of 60 pieces per hour, quite high considering that about .008" per side is removed from the 8" diameter saws—a total surface of about 100 square inches, both sides included.

Also, among recent developments in production grinding machines is the tool shown in Fig. 5A designed for grinding both sides and both ends of drop forged engineers' wrenches and other parts that require grinding of parallel surfaces. This machine—the Besly No. 226-30" Double-Spindle Wet Grinder—features a combination magnetic vibrator and automatic chain feed especially designed for fast and accurate feeding of parts through the grinding wheels. As a



typical example of its productivity, and using oil as a coolant, this new grinder turns out 2400 wrenches per hour, measuring 8" over-all and ground on all form surfaces.

It becomes evident, from the nature of the work and the high output attained, that the engineering of the tool involved considerable ingenuity and forethought to operating conditions. For one thing, ring type grinding wheels employed on a previous machine quickly developed taper, which was reproduced on the wrench faces. Thus, it was necessary to forego opening and closing the wheels, with the result that, in the new machine, the wrenches are guided straight through the grinder. Now, grinding wheel wear is evenly distributed and the wrenches emerge flat and parallel and close to specified thicknesses. This facilitates subsequent polishing operations.

Here, too, the operator is merely required to load the parts which after passing through the wheels drop into a receptacle at the rear of the machine. The parts are loaded on the vibrating feed trough, shown in detail in Fig. 5B, and each wrench is brought to the power chain feeder by weight pressure of the wrenches behind it. Upper and lower adjustable guides (shown at extreme left) support the work as it is forced against the grinding members, and coolant is supplied to the grinding wheels through the hollow spindles, thus insuring full distribution with adequate cooling.

From the foregoing, it should be apparent that production grinding machines, of which a few typical examples and applications have been shown, are vital tools in the modern scheme of mass production. They increase output and cut costs, greatly reduce handling of work, and, as now developed, provide a high degree of operator convenience and safety. Furthermore, they are capable of producing very accurate work with surface finishes that, in many instances, require no further processing or polishing.

The machines mentioned in this article may be seen by visitors to the N.M.T.B.A. Show. They will be exhibited by Charles H. Besly and Company, at Booth No. 275.

### Miniature Mill Rolls Tissue - Thin Metal

IN ORDER TO OBTAIN very thin strips of Hiperco for experiments in magnesium Westinghouse Research Laboratories employ a miniature Sendzimir cold strip mill, which stands less than the height of a man and is about as wide as an office desk. Hiperco is the new Westinghouse magnetic alloy that may make possible aircraft motors and generators 10% lighter than those now available of the same power.

Each part of the delicately balanced roll mechanism is ground to an accuracy of 1/10,000" to assure precision in rolling metal to 1/2,000" thick. The two rolls that do the work measure less than ½" diameter, giving 40 times more pressure than would the larger rolls of ordinary mills. A 100' length of metail 1/40" thick is fed at speeds up to 200' per minute. The material being worked is wound on 12" reels on each side of the working rolls and is passed back and forth seven times before it reaches the desired 1/2000". A Westinghouse Rototrol Regulator maintains the proper tension on the strip. The mill itself was designed by the Armzen Company, Middletown, Ohio.



## Automatic Size Control of Cylinder Bores

An improved process holds cylinder bore to a consistent ±.0005"

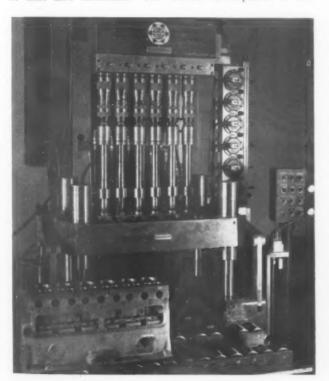
In production automobile plants, it is standard practice to manufacture and stock pistons in a range of sizes. Then, as the cylinder blocks come to the assembly line, each cylinder is measured and a piston is selected to fit. The fit of the pistons must be kept to very close tolerances and, therefore, the greater the variation in bore sizes, the more pistons must be stocked to meet these variations.

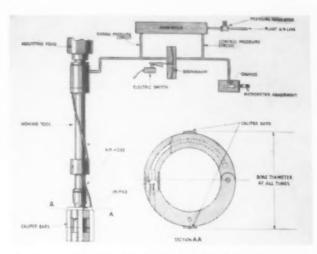
With the development of a new boring tool and head, by the Micromatic Hone Corporation Detroit the foregoing may now be stated in past tense. For this tool now materially reduces if it does not entirely eliminate the selective fitting of pistons in automotive cylinder bores. The new head automatically controls the finished bore sizes.

#### Hydrosizing controls bore diameter.

Honing, which has been pioneered by the Micromatic Hone Corporation, is the last operation on the finishing of cylinder bores. In developing the process, the company has worked for several years to develop a means of keeping cylinder bores to a uniform size. As a result, there has come about a new order of thinking in relation to control of bore sizes and accuracy, within close tolerances, and two developments, in micro-honing, have made it possible to maintain this accuracy in production operations.

One of these developments is controlled positive feed-out of the tool, which is expanded at a controlled rate by a hydraulic cylinder. This positive expansion, which may be adjusted so that the high spots are honed before any stock is removed from the larger diameter of the bore, results in the bore being straightened and made round with a minimum of heat and distortion. The second development is the





hydrosize automatic size control, which incorporates an air gage built into the honing tool. The pressure in the gage drops in proportion to the stock removed from the bore. Then, when the bore has been honed to the desired size, the pressure drops to a predetermined point and the honing cycle is automatically completed.

The system is shown set up for operation in Fig. 1 where a Micromatic Hydrosize 6-spindle head, tools and fixtures have been mounted on a Barnesdrill Honing Machine. In a honing cycle of 30 seconds, this equipment removes an average of .004" stock from each of the six bores, in a cylinder block of the type shown, correct out-of-roundness and taper and holds the bore size within a variation of .0005".

The operator is merely required to load the block into the fixture and to press a button to start the honing cycle—and, of course, to unload the block on completion of the cycle. The feed-out of the tool, its collapsing and withdrawal, and the compensation for abrasive wear, is entirely automatic.

Operation of the Hydrosize aut matic sizing device is shown in detail in Fig. 2. Aair, take, from the plant air line, is reduced in pressure to about 6 pounds p s i by a pressure regulator, and distributed through a manifold. The air supply is put through two Venturi fittings into two circuits, independent of each other except that any variations in the air supply will affect both equally.

The pressure on each is controlled by the rate at which air is allowed to escape, and is not affected by conditions in the other circuit. In one—the control circuit—the pressure is controlled by a micrometer adjusted metering valve. In the other—the gaging circuit—the pressure is controlled by two "caliper bars" which measure the bore diameter. The pressure in the two circuits are on opposite sides of the diaphragm.

The orifices in the two circuits are adjusted so that, when the bore is smaller than the desired size, the pressure in the gaging circuit is greater than that in the control circuit. Then, as the bore reaches size, this pressure drops below that in the control circuit, moving the diaphragm. The movement of the diaphragm operates an electric switch which stops the extension of the tool. Then, when all bores are to size, the tools are collapsed and withdrawn.

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First Wednesday \*
B. J. Hazewinkel, Chairman 2355 Jasmine St.,
Deuver 7, Colo.

DETROIT, NO. 1 Second Thursday \* Leslie B. Bellamy, Chairman 220 E. Milwaukee Ave., Detroit 2, Mich.

ELMIRA, NO. 24 First Monday \* Edward Stachel, Chairman 927 Spruce St., Elmira, N. Y.

ERIE, NO. 62
First Tuesday \*
Mathew H. Hetzel, Chairman
1140 West 31st St., Erie, Pa.

EVANSVILLE, NO. 73
Second Monday \*
Frank J. Hausfeld, Jr., Chairman
R.R. No. 5, Box 30,
Evansville, Ind.

FAIRFIELD CTY., NO. 6 First Wednesday \*. Arthur R. Hunt, Chairman 64 Avon St., Devon 2, Conn. FLINT, NO. 68 Third Thursday \* Norman F. Snyder, Chairman 2006 Mt. Elliott, Plint 4, Mich.

FOND DU LAC, NO. 45 Second Friday \* William E. Rutz, Chairman 142 Dott St., Fond du Lac, Wis.

FORT WAYNE, NO. 56 Second Wednesday \* Emil W. Mellin, Chairman 914 W. Sherwood Terrace, Fort Wayne 6, Ind.

FOX RIVER VALLEY, NO. 72 First Tuesday\* Roy G. Frogness, Chairman Box 304, Rt. 3 Aurora, III.

GOLDEN GATE, NO. 28 Third Wednesday \* Floyd V. Snodgrass, Chairman 2601 Maxwell Ave.. Oakland 2, Calif.

HAMILTON, NO. 42 Second Friday \* William A. Alexander, Chairman 88 Prospect St. S., Hamilton, Ont.

HARTFORD, NO. 7 First Monday \* Richard A. Smith, Chairman 28 Harvard St., Hartford 6, Conn.

HOUSTON, NO. 29 Second Tuesday \* Homer Briggs, Chairman 6514 Pinehurst, Houston 3, Texas

INDIANAPOLIS, NO. 37 First Thursday \* John Horton, Chairman 816 N. Audubon Road, Indianapolis 1, Ind.

KANSAS CITY, NO. 57
First Wednesday \*
Leroy E. Campbell, Chairman
5912 College Ave.,
Kansas City 4, Mo.

LITTLE RHODY, NO. 53 Third Wednesday \* Wilfred J. Pender, Chairman 43 Seba Kent Road, Pawtucket, R. I.

LOS ANGELES, NO. 27 Second Thursday \* Leslie F. Hawes, Chairman, 1421 N. Edgemont, Los Angeles 27, Calif.

LOUISVILLE, NO. 54
Second Tuesday \*
John E. Paskey, Chairman
2322 Greenwood Ave.,
Louisville 11, Ky.

MADISON, NO. 75

1st Tues. after 1st Mon. \*

Fred H. Kessenich, Chairman
308 E. Wilson St.,

Madison 3, Wis.

MID-HUDSON, NO. 74 First Wednesday \* John L. Petz, Chairman Pendell Road, Poughkeepsie, N. Y.

MILWAUKEE, NO. 4
Second Thursday \*
Paul E. Butzin, Chairman
8104 Richmond Court,
Wauwatosa 13, Wis.

MONTREAL, NO. 50 Second Wednesday \* Henry T. Welch, Chairman 732 Victoria Ave., 5t. Lambert, Que.

MUNCIE, NO. 70 Second Wednesday \* Robert L. Waters, Chairman 811 March St., Muncie, Ind.

NASHVILLE, NO. 43 Third Friday \* C. L. McCaffrey, 1st V-Chm. 1513 Ashwood Ave. Nashville 4, Tenn. NEW HAVEN, NO. 41 Second Thursday \* Ray E. Gifford, Chairman 96 Kimberly Ave., East Haven 12, Conn.

NEW ORLEANS, NO. 60 Second Wednesday \* Carl Hazlewood, Chairman 6574 General Haig New Orleans 19, La.

NEW YORK, GREATER, NO. 34 First Monday \* Harmon S. Hunt, Chairman 325 Cherry St., Douglaston Manor, L.I., N.Y.

NIAGARA DISTRICT, NO. 65 Second Friday \* William L. Sandham, Chairman 94 Duncop Drive, St. Catharines, Ont.

NORTH TEXAS, NO. 51 2nd Friday \* Theodore A. Hersh, Chairman 2901 Westridge Ave. Ft. Worth 7, Texas

NORTHERN NEW JERSEY, NO. 14 Second Tuesday \* Edward T. Ross, Chairman 223 Bellevue Ave., Upper Montelair, N. J.

PEORIA, NO. 31
First Tuesday \*
R. C. Kolb, Chairman
98 N. Maplewood Ave.
Peoria 5, Ill.

PHILADELPHIA, NO. 15 Third Thursday \* Arthur R. Diamond, Chairman Greene Manor, Johnson and Greene Sts., Philadelphia 44, Pa.

PHOENIX, NO. 67
Third Wednesday \*
Harry E. Rivers, Chairman
Rt. No. 1, Box 43-D
Tempe, Arizona

PITTSBURGH, NO. 8 First Friday \* Paul H. Magnus, Chairman Tranter Mfg. Co., 105 Water St., Pittsburgh 22, Pa.

PONTIAC, NO. 69 Third Thursday \* Albert J. Rhodes, Chairman 1245 Rhodes Rd., Lake Orion, Mich.

PORTLAND (MAINE), NO. 46 Fourth Friday \* Carl L. Bohlin, Chairman 28 Hall Ave., Saco, Maine

PORTLAND (OREGON), NO. 63
\*Third Thursday \*
William E. Brennan, Chairman
3036 S.E. 33rd Ave.,
Portland 2, Ore.

POTOMAC, NO. 48 First Thursday \* Richard P. Thayer, Chairman 4704 Butterworth Pl., N.W. Washington 16, D. C.

RACINE, NO. 2
First Monday \*
William P. Clark, Chairman
2105 Washington Ave.,
Racine, Wis.

RICHMOND, NO. 66
Second Tuesday \*
Lowell B. Penland, Chairman
2509 E. Main St.,
Richmond, Ind.

ROCHESTER, NO. 16 First Monday \* Milton L. Roessel, Chairman 97 Biltmore Drive Rochester 12, N. Y.

ROCKFORD, NO. 12 First Thursday \* Earnest Y. Seborg, Chairman 1523 Huffman Blvd., Rockford, Ill. ST. LOUIS, NO. 17 First Thursday \* Edward H. Ruder, Chairman 57 Hanley Downs, Richmond Heights 17, M

SAN DIEGO, NO, 44
Second Tuesday \*
Raymond W. Peters, Chairman
2442 Comstock Drive
San Diego 11, Calif.

SCHENECTADY, NO. 20 Second Thursday \* John Stedman, Chairman 54 Broderick St. Albany 5, N. Y.

SEATTLE, NO. 39 Second Tuesday \* Gordon Munro, Chairman Rt. 4, Box 2432 Bremerton, Wash.

SOUTH BEND, NO. 30 Second Tuesday \* Edgar W. Helm, Chairman 1152 E. Victoria St., South Bend 14, Ind.

SPRINGFIELD (ILLINOIS), NO. 64 First Tuesday \* Henry G. Becker, Chairman 830 No. 5th St., Springfield, Ill.

SPRINGFIELD (MASS.), NO. 32 Second Monday \* Alexander W. Todd, Chairman 50 Johnson St., Springfield 8, Mass.

SPRINGFIELD (OHIO), NO. 76 First Monday \* James B. Douglas, Chairman 609 E. McCreight, Springfield, Ohio

SYRACUSE, NO. 19 2nd Tues. after 2nd Mon.\* Hugo C. Klix, Chairman 425 Glenwood Ave., Syracuse 7, N. Y.

TOLEDO, NO. 9
Second Wednesday \*
Albert Hage, Chairman
3700 Roanoke Rd.,
Toledo 12, Ohio

TORONTO, NO. 26 Second Monday \* L. M. Jardine, Chairman 6 Pepler Ave., Toronto, Ont.

TRI CITIES, NO. 23
Third Monday \*
Lennart N. Dahlen, Chairman
901 43rd St.
Rock Island, Ill.

TWIN CITIES, NO. 11
First Wednesday \*
Clifford V. Lofdahl, Chairman
5933 Elliott Ave. S.,
Minneapolis 7, Minn.

TWIN STATES, NO. 40 Second Wednesday \* Alan E. Stubbs, Chairman Highland Rd., Springfield, Vt.

WESTERN MICHIGAN, NO. 38 Second Monday \* Peter C. Maghielse, Chairman 2434 Miller Ave., N. W. Grand Rapids 4, Mich.

WICHITA, NO. 52 Second Wednesday \* Harold J. Bales, Chairman 1702 N. Lorraine Ave., Wichita 6, Kan.

WILLIAMSPORT, NO. 49
Second Monday \*
Lewis H. Bardo, Chairman
2347 Hillside Ave.,
Williamsport, Penn.

WINDSOR, NO. 55 Second Monday \* R. T. Richards, Chairman R.R. No. 1, Windsor, Ont.

WORCESTER, NO. 25 First Tuesday \* Charles W. Monigle, Chairman 364 Greenwood St., R.F.D. 2, Millbury, Mass.

## A.S.T.E. ASTE NEWS



## Boston Gives Another "Tea Party"

For A.S.T.E. 15th Semi-Annual Meeting

N 1773 Boston literally "threw" a big "tea party"—into the harbor. Next month townsmen and descendants of some of those famous "party-givers" will do some more large scale entertaining-of a different nature.

The occasion: 15th Semi-Annual Meeting of ASTE, symbol of the ingenuity that mechanized crafts of such metal workers as Boston's own Paul Revere. The time: October 30, 31, and November 1-anniversary of the summons served on consignees of the "party" tea. The place: Hotel Statler, in Park Square where the British gathered for their illstarred march on Lexington.

Through judicious allocation of the three days devoted to the Boston convention, the National Program and Host Chapter Committees have developed a schedule allowing visitors to participate in practically all of the technical sessions, as well as the plant tours of their choice.

The new arrangement, eliminating overlapping major events, will permit maximum professional benefit with but two days' absence from business.

"A New Concept in the Field of Abrasives" is the significant opening theme of an assembly to explore new and better ways of engineering modern industrial production. Sponsored by Norton Co. of Worcester, Mass., the Thursday afternoon discussion will be keynoted by W. T. Montague, Vice-Pres., and Mgr. of Business Planning and Development.

A. A. Klein, Asst. Director of Research, will continue with a description of the "Manufacture and Distinguishing Features" of the novel abrasive. Surfaces of the abrasive grain are claimed to contain numerous nubbly faces with reentrant angles, giving many cutting points per grain.

Among "Characteristics in Application" to be stressed by G. T. Rideout,

Chief Field Engineer, are such advantages as faster and color cutting, reduction of dressing and longer life. Chairman for this meeting is G. A.

Rogers of Montreal Chapter.

General Electric Co. will present the evening forum, "The Importance of Welding to the Tool Engineer." After an introduction by J. E. Anderson, Asst. to Works Mgr. at the River Works, W. Lynn, Mass., E. H. Girardot, Foreman of Tool Design at the Schenectady plant, will read a paper concerned with "Welding as Applied to the Construction of Tools, Dies, Jigs and Fixtures." Another phase, to be announced, will be treated by D. W. Puffer of the Welding Section at the Lynn River Works.

Presiding officer for the panel and subsequent open discussion will be H. E. Linsley of N. New Jersey Chapter.

E. W. Baumgardner, Cleveland Chapter, will introduce the speakers at the Friday afternoon session, "Material Handling." In "Economics of Good Material Handling Equipment," E. J. Burnell, Director and Vice-Pres. in Charge of Sales, Link-Belt Co., Chicago, will review developments in material handling, emphasizing effects of World Wars I and II on design and application of conveying equipment, as well as current advances.

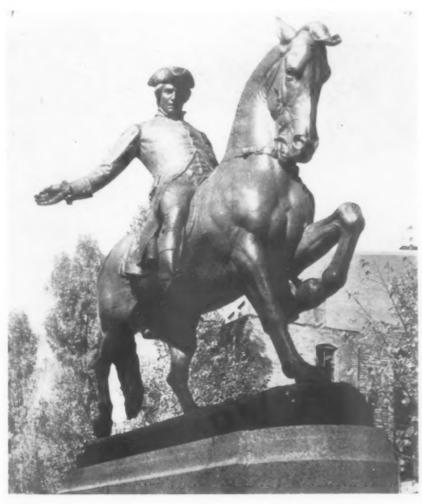
"Handling of Webs and Monofilaments" will be considered during a talk by C. A. Litzler, Pres., Industrial Ovens., Inc., Cleveland, who will describe web materials, processing developments, handling, impregnating, and continuous drying of web materials; handling and coating of monofilament materials; and indicative trends.

A thorough examination of material handling problems and methods used in their solution through "Visual Planning" will be demonstrated by H. H. Dasey, Pres., Visual Production Planning, Inc., Pittsburgh, using models.

An address by P. R. Minich, Sales Mgr., Rack Engineering Co., Pittsburgh, 'Material Handling in the Efficiently Organized Plant" as affecting stock, storage, shipping, and in minimizing damage to parts in process, will conclude the symposium.

A speaker skilled in interlarding technical data with Early New England.

Metal worker-patriot Paul Revere pauses in his historic midnight dash "through every Middlesex village and town" to rouse an outraged: citizenry



anecdotes is scheduled to give the keynote address of the Friday evening session, "Bearing Applications." E. W. Miller, Vice-President—Gen. Mgr., The Fellows Gear Shaper Co., Springfield, Vt., and an inventor of note and authority on gearing and gear design, will outline the development of bearings.

The tooling, heat treating and inspection methods which were worked out to cut rejection from 90% to 10% in the production of extreme precision ball bearings will be featured in the talk, "Bearing Selection," to be given by F. E. Ericson, Vice-Pres. of Barden Co., Danbury, Conn.

Lewis Sandler, Executive Vice-Pres., Johnson Bronze Co., Newcastle, Pa., will round out the study with a paper expounding the use of aluminum for plain bearings. This is a subject of unusual interest since aluminum is relatively unknown as a bearing material. A. A. Nichols of Boston Chapter will conduct this meeting.

Another in the series of programs dedicated to professional advancement will be sponsored Saturday morning by the National Education Committee and directed by its chairman, O. W. Winter of Buffalo-Niagara Frontier Chapter.

Under the heading, "Professional Development of the Tool Engineer," Dr. W. T. Alexander, Dean of Engineering, Northeastern University, Boston, will discuss "The Tool Engineer and America's Future Defense."

W. D. Merrifield, Asst. to Director of Technical Education, Chrysler Corp., Detroit, will state the case that "Industry Needs More and Better Tool Engineers." Dr. Mark Ellingson, Pres., Rochester Institute of Technology, Rochester, N. Y., will close the discussion with a subject to be announced.

\* \* \*

An industry, old to new England but new to ASTE seminars, will take the stage when J. O. Horne, Sales Mgr., J. O. Horne & Co., Rochester, N. Y., calls to order the final technical gathering Saturday afternoon.

Highlight speaker of "Tooling for Watches and Clocks" is W. E. Mutz, Treas., Chelsea Clock Co., Chelsea, Mass., who will tell of the tools, dies, production methods and special checking devices needed to manufacture and assemble the approximately 200 parts which "make time" in an accurate, spring wound clock or instrument.

Problems involved in "Tooling for Electric Clocks" will be pointed out by H. B. Whitehead, Gen. Supt., Telechron, Inc., Ashland, Mass. After a brief description of operating principles of synchronous motors, he will go on to detail essential parts of electric clocks and production requirements, specifying tooling and setups peculiar to this field.

Consideration of functional requirements, interchangeability and external appearance on a volume production basis presents a fascinating and sometimes vexing challenge in "Tooling for a Fine Watch" as E. W. Drescher, Supt. of Product Engineering, Hamilton Watch Co., Lancaster, Pa., will explain.

Examples quoted will show the influence of these factors on the design of single purpose, high-precision dies for producing high quality threads on the tiny screws for which there is no recognized national standard.

In summary, R. M. Tarpy, Mg'g Director of Vulcan New England Co., W. Hartford, Conn., will review "Mass Production of Watches and Clocks." Mr. Tarpy will deal with engineering and production problems, analysis of engineering organization, dies; screw machine production, secondary operations, subassembly and attendant tooling; and inspection procedures.

A remarkably diversified and extensive plant visitation schedule, including independent tours, has been set up by the Host Chapter. Details of this feature are reported in subsequent pages. Technical motion pictures will be offered Thursday and Friday mornings.

The Board of Directors elected at the Houston convention last March will convene Friday morning for the first time. Members of the Honor Awards-Judicial, Constitution and By-Laws, and Handbook Committees will confer Thursday. Slated for Friday are meetings of the Education, Public Relations and Standards Committees and the continuing Handbook session.

National Program and Host Chapter Committeemen will be on duty throughout the convention as will the press room staff and registration crew. (Registration fee is \$2 for members and \$3 for guests.) While the visiting engineers are engaged with technical and business affair their ladies will be received and entetained by wives of the Host Chaptmembers. A spacious lounge will be provided, and there will be several showings of a motion picture depicting Neuroland's attractions.

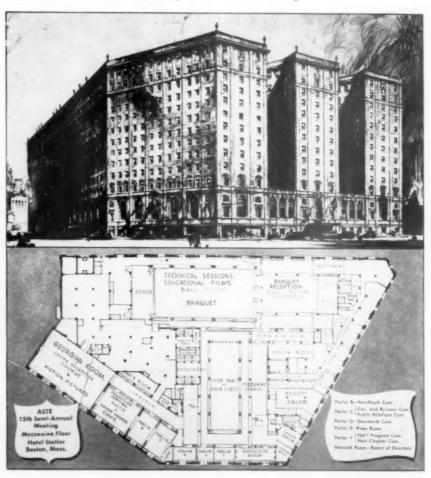
Thursday afternoon, the femininguests may inspect a mass production kitchen in a tour of the Charlestown plant of W. F. Schrafft & Sons Corp. world's largest candy manufacturers.

Radio stations will open their studies for a number of broadcasts; sight-seeing busses depart several times a day on guided tours of the city and its surroundings; and, of course, the fair sex will find its way, like a homing pigeon, to Boston's fine shops.

Members who had to take a rain check on the Texas meeting last spring can get that Western feeling at Gene Autry's rodeo in Boston Garden. Avid hockey fans will take in the playoffs of the Boston Olympics team at the Arena.

Secret "Boston Tea Party" features which the local committee has been cooking up will be revealed Saturday evening at the Semi-Annual Dinner, grand social finale of what will probably be one of the most heavily attended conventions in recent years.

Highlight of the evening will be an address by C. E. Wilson, President of General Electric Co., followed by professional entertainment, ringing down the curtain on the Society's 30th National Meeting.



## Your Hosts in "The Hub"

Asst. Gen. Chairman Host Chapter Committees







W. B. Wells



W. W. Young

Chairman Social Program



J. X. Ryneska



J. L. deVou, Jr.

Chairman Banquet



W. F. Jones

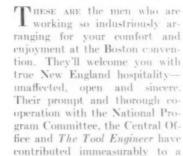
Co-Chairman Banquet







J. P. Crosby



J. F. Topham



0. W. Bonnafe

Chairman 'Tea Party' Committee

John Sylvester

Co-Chairman "Tea Party" Committee



J. C. Ewer



E. P. Krippendorf

Co-Chairman Reception





Chairman Transportation



smooth-running convention or-

ganization. Experienced in effective execution of their own special projects, Boston Chapter can be expected to successfully engineer

Co-Chairman Transportation



H. J. Richards

Co-Chairman Entertainment



Paul Davis

Chairman Entertainment





John Lindegren, Jr.



R. I. Robbins

Chairman Records and Reports



R. E. Powell

Chairman Signs



A. D. Forbes

Co-Chairman Budget



A. L. Potter

Chairman Budget



Chairman



H. A. Hudson



W. C. Swanson



J. L. Morosini



J. B. Savits



A. J. Leone

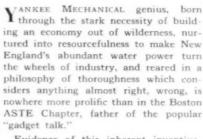




## Learning New Tricks in

Top: The portals of Massachusetts Institute of Technology will open to ASTE for inspection tour. Center: Laboratory worker shows how lines of stress converge under polarized light. Bottom: A graduate student does research on tunnel lining in M.I.T.'s Materials Testing Laboratory

## 26 New England Plants Will Show Diversified Industrial Operations



Evidence of this inherent inventiveness will be seen in a wide variety of manufacturing plants who will play host to the Society during the Boston convention.

On Thursday morning, the visiting engineers have a choice of five entirely different trips.

Chelsea Clock Co., Chelsea, for 50 years makers of fine timepieces and clockwork instruments for use on land and sea, will show the precision, minute parts, painstaking operations and extensive tooling required to provide Navy, merchant marine and civilians with accurate time.

All clocks, weather recording and other instruments made by the Chelsea company are hand wound types.

Gears that soar to the stratosphere in aircraft and plunge to ocean depths in submarine applications are among the myriad types produced by the Boston Gear Works, Inc., North Quincy, pioneer manufacturers of standard gears.

Here, ASTE convention guests will see cutting machines for all types of gears, racks, and sprockets; others for grinding the teeth of hardened spur gears and

Gigantic projects, common in the General Electric River Works at W. Lynn, include, left: Radial drilling a huge casting; center: Pouring a large mold in the foundry; and right: Big work in the turbine shop of the plant that built the TG-180 jet propulsion engine for the P-84 plane

worms and for lapping the teeth of hardened spiral bevel gears.

Production of automatics, turret lathes, broaching equipment, drilling, milling and boring machines, external, internal and surface grinding machines will be studied. The speed reducer unit assembly department, tool room, hardening plant and pattern shop also will be open for inspection.

The ASTE Nicholses, W. H., William Hart, and Arthur A., will welcome fellow members to their firm, W. H. Nichols Co., Waltham. In this splendid precision shop, equipped with the latest machine tools and inspection devices, the problems of mass producing rayon, nylon, gerotor and aircraft de-icing pumps were conquered.

An interesting feature of this trip will be the opportunity to observe many actual applications of one of the company's own products, a miller developed from Clarence Whitney's rise and fall type of machine which brings the cutter to the work instead of vice versa.

Your new automobile may not have come off the assembly line yet, but at the Ford Motor Co.'s Somerville plant you'll see a passenger car or truck driven off every two minutes and 24 seconds, after its two and one-half hour journey along the 1000-foot line.

Spaced 25 feet on centers, 35 units glide along the final assembly line at the rate of 13 feet per minute, to reach the present daily output of 200 finished vehicles.

If you're already having difficulty selecting your plant tour, you'll be torn with indecision at the additional prospect of a visit to the U. S. Naval Shipyard at Charlestown.

Oldest in the nation, this Navy Yard has been in continuous operation since 1800. Navy personnel will escort ASTE visitors along the famous "Rope Walk" where all the Navy's hemp rope is made, through the die and forge shops to see









## Yankee Ingenuity

hains being produced, and the machine stop and tool room which implement their manufacture.

To top it all off, you'll have the thrill boarding "Old Ironsides," the undersated War of 1812 frigate "Constitution." Saved from oblivion by the school children of the nation, the gallant old veteran of 40 naval engagements has been rebuilt and restored to its former condition.

Friday morning, plant tour busses will depart for West Lynn and the General Electric River Works where large scale operations occupy departments engaged in the manufacture of turbines, welded products, gears and AC motors, with the attendant press work.

The assembly of packaging machines used by tea companies and allied food concerns, as well as the general machine equipment, will be demonstrated at Pneumatic Scale Corp., Ltd., North Quincy.

Within the windowless factory of Simonds Saw & Steel Co., Fitchburg, workers will exhibit the skill and precision required to produce band saws, hack saws, machine knives and files.

Proper selection and use, for top performance from these cutting tools, will be explained.

At the conclusion of the plant visitation, the Simonds company will be host at a buffet luncheon in the Raymond Hotel.

Repeat tours of the Ford Co., W. H. Nichols Co., and the Navy Yard also are scheduled for Friday.

Open house will be the order at Massachusetts Institute of Technology in Cambridge, Saturday morning, the ASTE party being free to visit any part of the institution. Interest is expected to center, however, around such departments as:

Mechanical Engineering—machine tool laboratory, materials testing, steam, hydraulic, automotive, heating measurements and stress analysis.

Aeronautical Engineering—wind tunnel, engine design and air flow research; Electrical Engineering—laboratories and research; and Mechanical Metallurgy, including heat treating, hot and cold working, welding, foundry, and forging.

In addition to this attractive program, the Host Chapter Committee has arranged for visitors to be admitted to the following plants, the guest to provide his own transportation:

Arthur A. Crafts Co., Inc.—gages and tungsten carbide tools; Meisel Press Mfg. Co.—precision ground gears and printing presses, both for color and black and white printing; Rivett Lathe & Grinder Co.—bench lathes and grinders; and Special Tool & Machine Co.—well-equipped die shop specializing in the making of molds for the plastic industry and soap manufacturers; all of Boston proper.

B. C. Ames Co.—micrometer dial gages and indicators; Waltham Machine Works—small automatic machinery; both of Waltham.

The Heald Machine Co.—internal grinding machines; and Worcester Pressed Steel Co.—light and heavy steel stampings, including tour of John Woodman Higgins Armory; all of Worcester.

Brown & Sharpe Mfg. Co.—machine tools, tools and gages; and Standard Machinery Co.—large roller bearings, punch presses, die sets, and rolling mills for precious metals; both in Providence, R. I.

Bay State Abrasive Products Co., Westboro; The Blanchard Machine Co., Cambridge—grinding machines; Lapointe Machine Tool Co., Hudson—broaching machines and broaches; Mason-Neilan Regulator Co., Dorchester—regulators and valves.

H. K. Porter, Inc., Everett—hand cutting tools and automobile body repair equipment; Trimont Mfg. Co., Roxbury—pipe wrenches and pipe vises; and Farrington Mfg. Co., Jamaica Plain—display packaging equipment and Charga-Plate systems.

"Making time" at Chelsea Clock Co. involves, top: Drilling holes as small as 0.006" in diameter; center: Hobbing mainspring barrels; and bottom: Forming teeth on a special rotary gear cutter







In the precision shop of W. H. Nichols Co., members will see, left: Generation of pump rotors by grinding; center: Planetary internal grinding; and right: Production grinding of gear teeth







# Program A.S.T.E. Fifteenth





They Planned It





Secretary Natl. Program Com. J. O. Horne

Natl. Program Com.

Natl. Program Com.



A. A. Nichols Natl. Program Com.



H. E. Linsley Natl. Program Com.



C. H. Peters Chairman Natl. Education Com.



G. A. Rogers Natl. Program Com.



0. W. Winter



A. D. Lewis

### Hotel Statler, Boston, Mass.

THURSDAY, OCTOBER 30, 8:30 A.M.

Registration, Mezzanine

9:00 A.M.

Plant Tours—Boston Gear Works, Inc., N. Quincy; Chelsea Clock Co., Chelsea; Ford Motor Co., Somerville; W. H. Nichols Co., Wal-tham; U. S. Naval Shipyard, Charlestown

Educational Motion Pictures, Ballroom Honor Awards-Judicial Committee Meeting, Parlor A

10:00 A.M.

Constitution and By-Laws Committee Meeting, Parlor C Handbook Committee Meeting, Parlor B

2:00 P.M.

Technical Session, Ballroom

Chm., G. A. Rogers, Sales Eng., Rudel Machinery Co., Montreal "A New Concept in the Field of Abrasives," W. T. Montague, V.-Pres. and Mgr., Business Planning and Development, Norton Co., Worcester, Mass.

"Manufacture and Distinguishing Features," A. A. Klein, Asst. Director of Research, Norton Co., Worcester, Mass.

"Characteristics in Application," G. T. Rideout, Chief Field Eng., Norton Co., Worcester, Mass.

8:00 P.M.

Technical Session, Ballroom

Chm., H. E. Linsley, Machine Tool Editor, The Iron Age, New York City

"The Importance of Welding to the Tool Engineer"

(Subject to be announced) J. E. Anderson, Asst. to Works Mgr., General Electric Co., River Works, W. Lynn, Mass.

"Welding as Applied to the Construction of Tools, Dies, Jigs and Fixtures," Edward H. Girardot, Foreman, Tool Design, General Electric Co., Schenectady, N.Y.

(Subject to be announced) D. W. Puffer, Welding Section, General Electric Co., River Works, W. Lynn, Mass.

FRIDAY, OCTOBER 31, 9:00 A.M.

Plant Tours—Ford Motor Co., Somerville; General Electric Co., River Works, W. Lynn; Simonds Saw & Steel Co., Fitchburg; Pneumatic Scale Corp., Ltd., N. Quincy; U. S. Naval Shipyard, Charlestown; W. H. Nichols Co.

Educational Motion Pictures, Ballroom Education Committee Meeting, Parlor A

10:00 A.M.

Board of Directors Meeting, Hancock Room Handbook Committee Meeting, Parlor B Standards Committee Meeting, Parlor D

## Semi-Annual Meeting



### October 30-31, November 1, 1947

#### FRIDAY, OCTOBER 31, 2:00 P.M.

#### Technical Session, Ballroom

Chm., E. W. Baumgardner, Mach. and Tool Designer, Industrial Ovens, Inc., Cleveland, Ohio

"Material Handling'

"Economics of Good Material Handling Equipment," E. J. Burnell, Director and V. Pres, in Charge of Sales, Link-Belt Co., Chicago, Ill. "Handling of Webs and Monofilaments," C. A. Litzler, Pres., Industrial Ovens, Inc, Cleveland, Ohio

"Visual Planning for Production," H. H. Dasey, Pres., Visual Production Planning, Inc., Pittsburgh, Pa.

"Material Handling in the Efficiently Organized Plant," P. R. Minich, Sales Mgr., Rack Engineering Co., Pittsburgh, Pa.



#### Technical Session, Ballroom

Chm., A. A. Nichols, Partner, W. H. Nichols Co., Waltham, Mass. "Bearing Applications'

(Subject to be announced) E. W. Miller, V.-Pres.-Gen. Mgr., The Fellows Gear Shaper Co., Springfield, Vt.

"Bearing Selection," F. E. Ericson, V.-Pres., Barden Co., Danbury,

"Plain Bearings," Lewis Sandler, Exec. V.-Pres., Johnson Bronze Co., Newcastle, Pa.

#### SATURDAY, NOVEMBER 1, 9:00 A.M.

Plant Tour-Massachusetts Institute of Technology, Cambridge

#### 9:30 A.M.

#### Technical Session, Ballroom

Chm., O. W. Winter, Pres., Acme Pattern & Machine Co., Buffalo,

"Professional Development of the Tool Engineer"

"The Tool Engineer and America's Future Defense," Dr. W. T. Alexander, Dean of Eng'g, Northeastern University, Boston, Mass, "Industry Needs More and Better Tool Engineers," W. D. Merrifield, Asst. to Director of Technical Education. Chrysler Corp., Detroit, Mich.

(Subject to be announced) Dr. Mark Ellingson, Pres., Rochester Institute of Technology, Rochester, N.Y.

#### 10:00 A.M.

Board of Directors Meeting, Hancock Room

#### 2:00 P.M.

#### Technical Session, Ballroom

Chm., J. O. Horne, Sales Mgr., J. O. Horne & Co., Rochester, N.Y. "Tooling for Watches and Clocks"

(Subject to be announced) W. E. Mutz, Treas., Chelsea Clock Co., Chelsea, Mass.

"Tooling for Electric Clocks," H. B. Whitehead, Gen. Supt., Telechron, Inc., Ashland, Mass.

"Tooling for a Fine Watch," E. W. Drescher, Supt. of Product Eng'g, Hamilton Watch Co., Lancaster, Pa.

"Mass Production of Watches and Clocks," R. M. Tarpy, Mg'g. Director, Vulcan New England Co., W. Hartford, Conn.

#### 6:00 P.M.

Banquet Reception, Ballroom Assembly

#### 7:00 P.M.

#### Semi-Annual Dinner, Ballroom

Speaker (tentative); C. E. Wilson, Pres., General Electric Co., New York City



W. T. Montague



### They'll Present It





W. T. Alexander



E. W. Drescher



Mark Ellingson



A. A. Klein



R. H. Tarpy



H B. Whitehead



G. T. Rideout

## You've Read About It In History

### Now You'll See It in Boston

NAMES, DATES, places and events you struggled to memorize in your study of Early America will come to life when you visit Boston.

You'll see the oldest house in town, home of that versatile industrial pioneer, Paul Revere, who was pewter and silver smith, engraver, dentist and copper rolling mill operator. Nearby is the old North Church which gave the patriot Revere the momentous signal to begin his famous midnight dash.

Incidentally, Old Boston should be explored on "shanks' mares" sensibly shod with sturdy brogans. Vehicular traffic is hopeless and the sidewalk overflow takes to the pavement on narrow streets.

To touch on only the most sought out points of interest, there's the site of the original Boston "Tea Party," and the Old South Meeting House, rendezvous of its perpetrators; Faneuil Hall, the "Cradle of Liberty," now a teeming market place; and the tablet and circle of paving stones commemorating the Boston Massacre.

Along the waterfront there is T Wharf with its fishing fleet, and the Atlantic Avenue view of a busy seaport, while the 490-foot Custom House Tower affords a splendid panorama of land and sea. Across the bridge in Charlestown, Bunker Hill Monument and the proud old frigate Constitution symbolize American heroism.

The great, iron Province Gates once opened to admit visitors to the governor's residence. Where the City Hall stands, Benjamin Franklin learned the printing trade. In pre-Revolutionary

King's Chapel, noon-day services are held.

Its graveyard and the neighboring Old Granary Burying Ground provide resting places, marked by thought-provoking epitaphs, for many of the early city's illustrious personages.

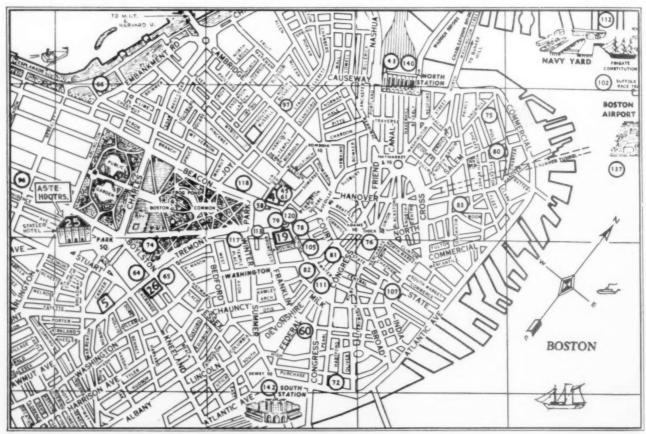
Farther along Tremont Street (short e), the main thoroughfare, the democratic "Common" is frequented by thousands each day. More decorous is the adjacent Public Garden with formal flower beds, unusual trees, and graceful swan boats sailing the placid lagoon.

Prominent on Beacon Hill, the State House with its Bulfinch front has sacrificed its brilliant gold dome to the exigencies of wartime camouflage. The central private park of aristocratic Louisburg Square once substituted for Lon-

### Old Boston Is an Adventure with Surprises at Every Turn

#### KEY TO MAP OF DOWNTOWN BOSTON

	KEY TO MAP OF DOWNTOWN BOSTON	
Airport	Faneuil Hall	Old Granary Burying Ground
loston City Club	Hotel Bradford 5	Old South Meeting House
Soston Garden 43 Soston Tea Party Site 72	Hotel Statler, ASTE Hdqtrs	Old State House
Surroughs Newsboy's Foundation	King's Chapel and Burying Ground 78	Park St. Church
Chamber of Commerce 60	Knights of Columbus	Post Office
Copps Hill Burying Ground	Museum of Natural History 96 Navy Yard 112	South Station
Custom House	New England Museum	Suffolk Downs
dward Hatch Memorial She!l	North Station140	Tremont Temple









don's Russell Square in the filming of Becky Sharpe's marriage. Old brownstone fronts on "The Hill's" incline frame ancient windows purpled by chemical action of atmosphere and sun.

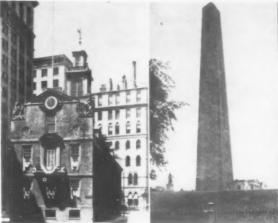
Museums, libraries, colleges and universities, a distinguished Symphony, and a passion for preserving tradition and antiquity all bespeak Boston's cultural heritage. Its environs, in every direction, are dotted with historical and literary shrines and the purely picturesque.

On Lexington green, the bronze figure of Captain Parker commands: "Stand your ground. Don't fire unless fired upon. But if they mean to have a war, let it begin here." Beyond is Concord—the North Bridge, alert Minute Man statue and poignant inscription; home of the Concord grape and of "Little Women." Pause for luncheon at the Wayside Inn in Sudbury, its windows diamond-scribbled by literati of its day.

Along the lovely North Shore, Marblehead and Salem intrigue with quaint streets and elegant homes built by clipper trade merchants. At Hawthorne's "House of the Seven Gables," you enter through Hepzibah's shop and climb the secret staircase to Clifford's room.

Gloucester and Rockport delight the eye with colorful fishing boats, artists and shops. Overlooking the "Reef of Norman's Woe," inventor John Hayes Hammond's estate, constructed and authentically furnished as a medieval castle, is well worth a visit.

Or choose the South Shore to Quincy and the Adams Mansion; Minot's Light off Cohasset, romantically termed the "I love you" light for its 1-4-3 flashing beacon; Marshfield, notable for Daniel Webster's pleasant old house; and the Duxbury cottage where John and Priscilla Alden found bliss.



And finally Plymouth, to see the actual rock on which the Pilgrims stepped ashore. Here, too, is the pathos of Cole's Hill where nearly half the Mayflower's passengers were buried during their first winter in the new land. On Governor Bradford's obelisk, the significant words, "Do not basely relinquish what the Fathers with difficulty attained," give food for sober reflection on the precious freedom which today's subversive forces insidiously seek to usurp.

Top, from left: Dallin's Appeal to the Great Spirit lifts supplicating hands before Boston Museum of Fine Arts; built in 1660, home of Paul Revere still welcomes visitors; State House dome is Beacon Hill landmark. Lower: Declaration of Independence was first read to public from Old State House balcony; Bunker Hill Monument was completed through efforts of American women; Park St. Church on "Brimstone Corner" overlooks the Common. Below: Symphony concerts float over the Charles River from Esplanade music shell. Bottom: Quiet cloister in court of Isabella Stewart Gardner Museum of Italian art; "Old Ironsides," now a national museum; Wayside Inn, oldtime hostelry









#### Lincoln Welding Award Contest Extended to November

Detroit, Mich.-Closing date for submitting nominations for the ASTE Lincoln Arc Welding Award, sponsored by James F. Lincoln Arc-Welding the Foundation, has been extended to November 15, A. J. Siegel, Chairman of the Honor Awards Committee, has an-

Originally scheduled to close September 30, the first annual competition for the best manuscript relating to advancement of the theory and practice of arcwelding in the field of tool engineering, will now be open to additional papers presented before local Chapters and National Meetings of the Society or published in or accepted for publication in The Tool Engineer during the six week extension period.

Chapters are urged to study any such papers read before their members, for consideration as entries. Members who have done outstanding work in arc welding are requested to submit manuscripts on this subject before the November 15 deadline.

The award consists of a two and onehalf inch gold medal suitably inscribed and an engraved certificate to be presented at the Society's Annual Dinner next March.

Primary basis for the award will be the value of the paper as an original contribution, not as an exposition of some development already known. All such papers publicly presented before the Society automatically become eligible for

consideration by the Award Committee. Candidates must be members of the American Society of Tool Engineers. Nominations for consideration may be submitted by any ASTE Chapter or member to: Executive Secretary, American Society of Tool Engineers, 1666 Penobscot Bldg., Detroit 26, Mich., on or before November 15, 1947.

Three copies of the paper should accompany the nomination, if the paper has been presented at other than a National Meeting of the Society or in one of its official publications.

Administration of the award will be effected by a committee of judges, known as the Lincoln Award Sub-Committee and recommended by the Honor Awards Committee.

#### New Literature to Aid In Membership Drive

Detroit, Mich.-A new information booklet explaining the Society, its functions and activities, membership privileges and obligations, has just been issued by the National Membership Committee, Chairman Howard E. Volz has announced.

The attractive promotional piece, featuring the Society's colors, blue and gold, replaces an earlier red-covered edition.

Available to Chapters for distribution to prospective members, it is part of the Membership Committee's campaign to reach the 25,000 membership mark.

### Other News In This Issue

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Boston and Worcester Chapter officers meet to formulate Standards Committee activities. From left, standing: R. G. Van Keuren, H. F. Thompson, Frank Smith, C. D. Schofield, G. W. McGinley, J. P. Crosby, L. W. Macomber, H. G. Howe, Frank Smith and W. W. Young. Seated: J. W. Anthony, F. W. Copp, C. R. Pardee, S. F. Girard, National Standards Committee Secretary; J. X. Ryneska and L. M. Nielsen



#### Nielsen to Represent ASTE on ASA Committee

Boston, Mass.-Louis M. Nielsen Industrial Engineer at General Electric Co. River Works, West Lynn, Mass., was appointed Chairman of the ASA Committee B-5 on Standardization of Taper Pins at a meeting July 23, sponsored by the ASTE National Standards Committee and attended by Standards Committeemen and other officers of Boston and Worcester Chapters.

Standards Secretary S. F. Girard of the Central Office in Detroit was the National Standards Committee delegate to the dinner meeting in the Smith House, Cambridge.

Mr. Nielsen, who is Chairman of the Boston Chapter Standards Committee, will represent ASTE in the ASA group.

Increased activity in the data sheet program is expected as a result of the meeting which further acquainted the Standards Committeemen of both Chapters with the procedure to be followed in preparing sheets for submission to the National Standards Committee.

Attendance at the Boston meeting included: Chairman J. X. Ryneska, First Vice-Chairman W. W. Young, Second Vice-Chairman J. P. Crosby, Standards Committeemen J. W. Anthony, F. W. Copp, Frank W. Smith, G. W. McGinley, L. W. Macomber and Frank R. Smith, and Mr. Nielsen, all of Boston

Second Vice-Chairman C. D. Schofield. Treasurer H. F. Thompson, Standards Chairman C. R. Pardee and Committeemen R. G. Van Keuren and H. G. Howe of Worcester Chapter.

Mr. Girard plans to visit other Chapters from time to time to coordinate the activities of the National Standards Committee and the local groups

#### Strenuous Sports Engage Picnickers

Rochester, N.Y.-Some 250 Rochester members had a pleasant day of recreation at the Chapter's Ninth Annual Picnic held lately at the Buholtz picnic grounds.

Those not actively participating in the numerous sports events enjoyed chatting with their associates.

In the rip-roaring balloon "busting" contest, "Ben" Frinchini emerged as winner, but nearly collapsed from exhaustion after breaking his opponent's bal-

"Bill" Colaise established a new record in the popular golf driving contest. He couldn't hit the ball, but he did hit the tee farthest out in the field.

"Russ" Howard's "Pro's" defeated Paul Yingling's "Yearlings" in an exciting baseball game.

Twenty-five assorted attendance prizes were awarded to lucky ticket holders. A buffet lunch was served and snacks were available until the conclusion of the outing in the evening.

Ernest Straw, Entertainment Chairman, headed the committee in charge of the event.

#### Cleveland Show Committee Meets to Plan Program

ASTE Exposition at Cleveland, March 15 10, will be developed in a conference Statember 12 between the Exposition Committee and the Society's advertising an ney, Brooke, Smith, French & Dormace, Inc.

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The Committee, headed by Past Presndent C. V. Briner of Cleveland, includes Past Presidents A. M. Sargent of Detroit and Ray H. Morris of Hartford, and Loslie F. Hawes, Los Angeles Chapter Chairman.

Space inquiries have already been received from a number of former exhibitors eager to participate in the 1948 show. Previous exhibitors will have priority in the selection of space, and those who exhibited in the 1946 exposition will be offered a 30-day option on the location occupied at last year's show.

Provisions also are being made for an extended exhibit area to accommodate an even greater number of exhibitors.

For the exhibit guide and program of the 1948 exposition, the Committee proposes a three-way listing of exhibitors by company name, product, and booth number.

A daily registration list will be issued, giving a geographical and general indus-

#### Bridge, Director at Ford

Windsor, Ont.—Robert S. Bridge, General Works Manager of Ford Motor Co. of Canada, Ltd., has been elected to the Board of Directors, according to a recent announcement.

Mr. Bridge became associated with the automotive industry shortly after serving in World War I and filled a number of posts in production departments of major motor car manufacturers in Detroit before joining the Chrysler Corp. of Canada, Ltd., at Windsor in 1928.

Through successive appointments as Plant Engineer, General Production Superintendent, and Assistant to the Operating Manager, he became Vice-President and General Works Manager. In 1946 he resigned to accept the position of General Works Manager for the Ford Co.

#### British Member Takes Post With Canadian Firm

Toronto, Ont.—T. B. Brooke, until recently associated with General Aircraft, Ltd., of London, England, as tool engineer, is now serving as Assistant Engineer with the Atlas Polar Co. of Toronto.

During the war years, Mr. Brooke was Chief Inspector and Quality Manager for Fairchild Aircraft at Montreal.

Following the cessation of hostilities, he returned to his native England to assist General Aircraft in the production of a large air freight transport, a peacetime development of the Hamilcar military glider.

A former member of Montreal Chapter, Mr. Brooke is now affiliated with the Toronto group. trial breakdown of those attending the big tool show.

At the conclusion of the Exposition, exhibitors will receive a classified registration list showing each visitor's name, address, company and position, tabulated by occupation or office. This data will enable exhibitors to analyze the audience attracted to what is expected to be the largest display of tooling equipment ever sponsored by the Society.

An interested group of Dayton members bends closer for better view of machine at Thompson Grinder Co. in recent Chapter tour of Springfield plant

#### Crush Grinding Shown At Thompson Plant

Dayton, Ohio-More than 100 Dayton Chapter members and their guests participated in a recent tour of the Thompson Grinder Co. at Springfield.

Following dinner at the Shawnee Hotel, John C. Wilson, Chief Engineer and Sales Manager at the Thompson Co., spoke briefly on crush grinding before showing a film on this subject.

The entire party then adjourned to the Thompson plant where many interesting applications of crush form grinding were exhibited.



#### Large Binder Now Available for ASTE Data Sheets

A new one and one-half inch, threering binder for ASTE data sheets is being offered to members by the National Standards Committee.

With a capacity 50 per cent greater than the Society's regular binder, the new size will accommodate the fast-growing collection of numerically indexed data sheets being issued by the Standards Committee.

The words "Data Sheets" are stamped in gold down the spine for quick identification. Cost of the new, large binder is only \$2.00, with an additional charge of 75c for stamping the owner's name in gold on the front,

Delivery can be made immediately upon receipt of order. (Use the coupon below.)

TEAR OFF AND MAIL WITH YOUR CHE	CK OR MONEY ORDER NOT CURRENCY
Yes, I Want That Ne	w Data Sheet Binder
Send it to:	INK OR TYPEWRITE TO AVOID ERRORS
Street	
Cityzone	State
check  I enclose in amount	\$2.00 \( \tau\) to cover binder, packing, of and mailing charges.
	\$2.75 above with name imprint.
Shipments to Canada subject to Ca	nadian Import Tax at point of delivery.
(Signed)	(YOUR NAME)
CHAPTER NAME	MEMBERSHIP
Mail Order to: AMERICAN SO	CIETY OF TOOL ENGINEERS
1666 Penobscot Building	Detroit 26, Michigan



A reception committee lines up to greet guests at Philadelphia Chapter's outing at the Rifle Club

#### Windsor Named Secretary To Program Committee

Detroit, Mich.—Howard M. Windsor, former secretary to the General Manager, Automobile Club of Michigan, has joined the ASTE Central Office staff as Secretary to the National Program Committee.

Mr. Windsor, who was apprenticed as a lathe hand and cutter grinder, also has been employed in sheet metal and air conditioning, retail lumber, law, structural steel and industrial finishing equipment, and publicity.

During the war years, he was engaged in the construction and operation of a pilot plant for bomber fuel for the Research Div. of General Motors Corp.

At present he is coordinating the efforts of the National Program Committee and the Host Chapter Committee in the development of the Boston convention program.

Subsequently he will assist the National Program Committee in the revision and development of speaker and film lists to aid Chapters in presenting better programs.

"Duke," as he is known to his intimates, is married and the father of three daughters. His favorite hobby is building and collecting ship models, with philately a close second. Another leisure time project is carpentry, an interest which finds ample expression in the remodeling of his home.

#### Games and Entertainment Featured at Picnic

Philadelphia, Pa.—An attendance of approximately 225 Philadelphia members and their wives, coupled with perfect weather, made the Chapter's recent summer outing at the Philadelphia Rifle Club a highly successful affair.

The afternoon program featured softball, quoits, tennis, races and golf chipping. Those less physically inclined enjoyed themselves playing bingo, bridge and pinochle. Movies and fashion pictures were shown and prizes were awarded to winners of the various events.

Following dinner, professional entertainment and dancing rounded out the evening.

#### Situations Wanted

ENGINEER-48, with 30 years' experience in supervisory capacity, plant management, sales, production and personnel with top firms. Experienced in manufacture of machine tools, dies, optical and jewelry cases, department store items, and jobbing. Can furnish new items for manufacture and market same. Sr. Member, ASTE and ASM, seeking permanent connection with progressive firm. Complete resume on request. Single and in best of health. Resigning from present position Sept. . Preference, New England, New York or California, but will go anywhere. Address Box 121, American Society of Tool Engineers, 1666 Penobscot Bldg., Detroit 26, Mich.

INDUSTRIAL ENGINEER—41, seeks supervisory situation with progressive manufacturer. Past experience includes tool and die design, processing, product design and development, material procurement, and plant management. Graduate engineer as well as shop man. Unstinted loyalty and effort to employer who appreciates results. Detailed record and references upon request. Please write Box 122, American Society of Tool Engineers, 1665 Penobscot Bldg., Detroit 26, Mich.

PRODUCTION ENGINEER—thoroughly experienced in tool manufacturing, procedures, time study, methods, plant layout, and production problems, seeks Middle West connection. Details and references furnished to responsible parties stating their requirements. Reply to Box 123, American Society of Tool Engineers, 1666 Penobscot Bldg., Detroit 26, Mich.

YOUNG, AGGRESSIVE staff engineer available as assistant to president or general manager. Broad background—manufacturing methods, costs and estimating, tooling and special machinery, product design and development in automotive and machine tool industries. Chicago area preferred. Age 30; salary \$10,000. Address Box 124, American Society of Tool Engineers, 1666 Penobscot Bldg., Detroit 26, Mich.

#### ASTE-AFA to Cooperate In M.T. Congress Session

Chicago, Ill.—Joint sponsors of the September 19 technical session at the Machine Tool Congress will be ASTE and the American Foundrymen's Association, two of the host organizations conducting the Congress to be held concurrently with the 1947 Machine Tool Show, September 17-26.

Location of the ASTE-AFA meeting will be the Old Town Room, Hotel Sherman. Dinner at 6:30 P.M. will precede the technical program at 8:00 P.M. Presiding officer will be F. J. Schmitt, Chicago ASTE Chapter Chairman and Director of Sales, D. A. Stuart Oil Co., Ltd., Chicago.

The Society's speaker will be Myron S. Curtis, Assistant Director of Engineering, The Warner & Swasey Co., Cleveland, Ohio. Mr. Curtis will discuss "'Turning' Points in the Metalworking Industry."

T. E. Eagan, Chief Metallurgist for The Cooper-Bessemer Corp., Grove City, Pa., and Past Chairman, Grey Iron Div., AFA, will explain "When and How to Use Cast Iron."

Dinner reservations at \$3.00 per plate may be made with Mr. Schmitt at D. A. Stuart Oil Co., Ltd., 2727 S. Troy St., Chicago 23, Ill., up to September 17. From then until 11:30 A.M. on the 18th, reservations will be taken at the Machine Tool Congress desk in the Machine Tool Show registration area at the East entrance of the Dodge-Chicago Plant.

Serving with Mr. Schmitt on the committee arranging the session are C. V. Briner, Past President of ASTE, a Director of the Machine Tool Congress and Manager of the Small Tool and Gage Div., The Pipe Machinery Co., Cleveland; S. C. Massari, Technical Director, AFA, Chicago; and F. B. Skeates, Chairman, Chicago Chapter, AFA, and Foundry Superintendent, Link-Belt Co., Chicago.

#### Peirce Retires from Flannery

Pittsburgh, Pa.—W. B. Peirce, President of ASTE, retired August 15 from Flannery Bolt Co. after 13 years' service, as Works Manager and more recently as Vice-President of Research and Development.

He is now affiliated with the G. C. Wood Co., manufacturer's representatives, with offices at 613 Clark Bldg., Pittsburgh. Mr. Peirce expects to divide his time between his new business connection and his activities as chief executive of the Society.

In addition to completing nearly a half-century in the metal working industry, he has served as director in a number of companies, taken an active part in civic affairs at Buffalo and Pittsburgh, and held several public offices in these communities.

President Peirce has served continuously since 1939 in various Chapter and National Society offices.



Humorous remark by speaker at recent Los Angeles meeting is appreciated by, from left: R. C. Reimann, U. S. Electrical Motors, Inc.; Rudolph Powroznik, Treas.; and R. Gerald Stronks, 1st V-Chm., Los Angeles Chapter; and R. C. Gordon of Gordon Equipment & Supply Co., technical speaker

#### "Going the Extra Mile" Production Stimulant

Los Angeles, Calif.—Los Angeles members assembled July 8 to hear Napoleon Hill, Ph.D., Litt.D., noted author of success books, explain "What 'Going the Extra Mile' Means to Industry."

His subject Dr. Hill defined as giving more service, with the right mental attitude, than is expected.

Two types of people, Dr. Hill pointed out, are doomed to failure—the one who never does anything he is told and the one who never does anything else.

Technical speaker for the evening was R. C. Gordon of Gordon Equipment & Supply Co. Mr. Gordon's subject was "Production Economy Through Multiple Drilling and Tapping."

In his talk, the speaker stressed that combining drilling and tapping in one head is impractical, since rates of speed and advance into the workpiece differ widely.

For these applications of drill heads, he advocated jigs of special design. Contrary to conventions, he added, the drill jig should be fastened to the drill press table, and only the workpiece and clamping lever should be handled.

Mr. Gordon exhibited samples of work done with Zagar gearless drillheads and Commander multi-drills at rates of efficiency claimed to be heretofore unattainable.

Among members and guests introduced by Chairman Leslie F. Hawes were R. C. Reimann, Field Engineer for U. S. Electrical Motors, Inc., who invited the members to visit his plant for their next meeting, and Louis Nanchy, recently transferred from the General Electric plant at Bridgeport, Conn.

### Will Teach Engineering

Cleveland, Ohio—William A. Dorff, formerly a tool engineer at Thompson Products Co. and an associate member of the faculty of Cleveland Engineering Institute, has resigned his position at Thompson's to become a full-time member of the Institute staff.

Mr. Dorff, who is active in membership work in Cleveland Chapter, ASTE, serves on the Jig and Fixture Committee of the "Tool Engineers' Handbook."

#### Rothert in Research

Toledo, Ohio—Lawrence F. Rothert, formerly Assistant Chief Engineer of Kent-Owens Machine Co., has joined the General Research Div. of Owens-Illinois Glass Co.

In his new position, Mr. Rothert is engaged in machine and process development for new products, as well as improvement of present equipment and processes.

After graduating from the University of Toledo in 1936 with a degree in electrical engineering, he became associated with Kent-Owens.

The immediate Past Secretary of Toledo Chapter, ASTE, Mr. Rothert now serves as First Vice-Chairman.

#### Resistance Welding Shown In Films and Equipment

San Diego, Calif.—Arthur D. Lewis, Los Angeles welding engineer and former Chairman of the ASTE Chapter in that city, was guest speaker at the July 8 meeting of San Diego Chapter.

Following an interesting talk on Resistance Welding, Mr. Lewis explained and demonstrated a display of fixtures and equipment. The speaker also showed a new General Electric Technicolor film, "Resistance Welding Controls."

Some earnest enthusiasm of life is the effectual cure for all disquiet,

-J. H. Thom

#### Obituary

J. William Hansen

J. William Hansen, 53, Foreman of the Machine Tool Div. at Michigan Tool Co., Detroit, Mich., succumbed June 22 to a brief illness.

A native of Chicago, Mr. Hansen was employed by several concerns there before going to Detroit where he had been associated with Michigan Tool for the past 23 years.

Affiliated with Detroit Chapter, ASTE, since 1934, he was a charter member of "The Hounds," ASTE social club organized at the 1938 convention in Pittsburgh.

#### Tool Engineer Plays Role In Suppression of Crime

Brampton, Ont.—The Tool Engineer, a veteran of the recent war against totalitarianism, is now serving in the fight against crime, according to R. A. Raaflaub, Machine Shop Instructor at the Institute of Penal Reform in Brampton.

An experiment in re-establishing first offenders committed to Canadian institutions of correction, the new machine shop school includes a pleasant class room, besides the shop. Capacity of Instructor Raaflaub's classes is ten students.

Among the 25 machines with which the shop is equipped are lathes, drill presses, milling machines, several types of grinders, a power saw, shaper, engraver and small turret. The machines are being painted in modern color dynamics.

"But we could use more back issues of *The Tool Engineer*," admits the Toronto Chapter member who shares his copies with his charges. "Our students would appreciate having some discarded numbers, as they enjoy using my file in their study of machine shop theory, mathematics and blue print reading."

Mr. Raaflaub offers to assist Chapters interested in learning about penal institution educational work and is eager to communicate with members engaged in similar activity.

### **Coming Meetings**

Boston—October 30-31, November 1, ASTE Semi-Annual Meeting, Hotel Statler.

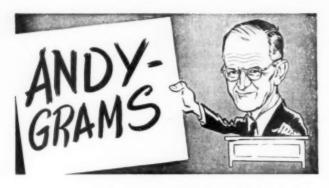
Buffalo-Niagara Frontier—September 13, Annual Picnic, Walker's Grove, Williamsville, N. Y. Visiting members invited.

CHICAGO—September 19, Dinner and technical session sponsored by ASTE-AFA in conjunction with Machine Tool Congress and Machine Tool Show. Dinner, 6:30 P.M., program, 8:00 P.M. Speakers and subjects: Myron S. Curtis, Asst. Director of Eng'g, The Warner & Swasey Co., Cleveland, Ohio. "'Turning' Points in the Metalworking Industry." T. E. Eagan, Chief Metallurgist, The Cooper-Bessemer Corp., Grove City, Pa. "When and How to Use Cast Iron." (See story elsewhere in this section.)

CLEVELAND—March 15-20, ASTE Exposition and 16th Annual Meeting, Cleveland Public Auditorium.

Toledo Yacht Club. Speaker and subject to be announced. October 8, 7:00 P.M., same place. Speaker: Roy McDermott, Spicer Mfg. Corp., Toledo, Ohio. Subject: "Manufacture of Power Transmitting Gears."

Your Boston convention hotel reservation form is on the way Mail it immediately for choice accommodations



FOR MANY MOONS, now, I've been dispensing information and know-how to readers North, East, West, South, all of which, of course, is part of the service we promised our members when the new *The Tool Engineering* was launched. And, to judge from letters of acknowledgement, requests for information have been satisfactorily answered on the whole. That is, all but one, and now I want some help on locating what has proven to be a most clusive "needle in the hay-stack."

Somewhere, somebody has designed and built a machine for simultaneously milling and drilling the feet of electric motor bases. So far I've been unable to locate the maker although I've a clear idea that I've seen a release or description of the machine. Therefore, I'm asking all of our 18,000 plus readers who read the Column to go through their mental files and help dig up the info. Please, now!—we tool engineers have to stick together.

That disposed of—and I'm fairly certain of results—I can sit back and relax. Fact is, I'm on vacation, up at Lake Manistee where I've vacationed the past several years. The same tangle of wilderness and the tang of pine and birch, the same glorious sunsets and the gentle lapping of waves to lull one to rest. In the rush of last minute packing, however, I forgot the fisherman's "De-Liar" I won in New Haven. But that's okay; I don't expect to catch any fish anyway, the license regardless, as I won't have much time for piscatorial diversion. Had to take my "office" with me a/e having to go to press early because of the coming Machine Tool Show.

Speaking of New Haven, I want to extend thanks to Ray Gifford and his fellow Chapter members for the privilege of having been with them in June. I'd been feeling low for some time, with recurring headaches, and had a blinger the evening I spoke in New Haven. But I got over it, and except for one slight growl haven't had a headache since. Goes to show what good fellowship and a change of scene will do for a guy. Now with a September meeting with the Twin States Chapter at Springfield, and two other meetings in prospect for Boston—in September and the Semi-Annual in October—I'll probably be rejuvenated for life.

Had intended to attend Detroit Chapter's golf party in July, but rush of work precluding, had to stick to my knitting. To my great surprise, Harry Conrad called me up to say that I'd won a set of golf clubs on the tickets I'd purchased. So, maybe I'll have to take up golf after all, although I'd been saving that diversion for later years. Y'see, I've the next 40 years all planned with ne'er a dull moment in the offing. But on second thought, maybe I'll swap the clubs for a gun—say one of these Stevens overand-under 22/.410 which are swell for target and skeet shooting.

From one thing to another, I want to introduce our new Editorial Associate, Watson N. (Doc) Nordquist, of whom you'll probably see quite a bit from now on. Doc is a serious minded young chap and very much on the ball. If he keeps on the way he's started—and he's lengthening his

stride—he is going to be a very valuable member of he Tool Engineering family. He seems to have the tool gineering mind, and that is what we need for this book.

The most of this (September) book will be devoted to the Machine Tool Show, although it is entirely beyond the Scope to more than scratch the surface of an exposition of such vast magnitude. In making up the book, however, we included an article by Exec. Sec'y Harry Conrad "History Says No!"—which originally appeared in Modern Machine Shop and which is reprinted by courtesy of the editors of that magazine. Few published articles have so patly presented the case for the machine and its role as a creator of employment and higher standards of living; hence it is entirely timely—and very "good reading"—in our Show Number.

The ASTE, of course, will participate in the Machine Tool Congress with (as I gather from advance notice) a joint session with the American Foundrymen's Association. The Tool Engineer will have a booth at the Show, where members and friends—and those who are to become our friends—will be welcome. Speaking for myself, I expect to be at the Show for its duration—Sept. 17 through 26—although I imagine my dogs will be growling plenty before the week is over. The show will cover plenty of area.

To tell the truth, I'm having a hard time sticking to my knitting. I'm writing on the porch of the cabin, and the great outdoors is calling, not to mention a big fish that just got away from an angler. (I live in hopes.) Oh well, I've only a few lines left of the Column, and that'll be one chore out of the way. By the end of the week (this is Tuesday) I should have all copy in the mail and then!—well, there's just going to be lots of fun and diversion. For one thing, the blueberries are ripening and I have anticipation of biting into a luscious pie, which (I hope) will be as good as the one Mrs. John Sundkvist treated me to when I was in Hartford a couple of years ago. It's great to have friends around the country.

One thing I've noticed, nobody seems to do any sailing hereabouts, although the lake is plenty big, with a steady northwest breeze blowing. The outboard seems to rule the inland lakes these days. But me, I've always had a yen for sailing, so came prepared. As you probably know, you can't tack against the wind without a centerboard or its equivalent in bottom. But, a small skiff can be converted into an excellent sailboat by resort to a "centerboard" made of fairly heavy sheet steel and hung over the side. So rigged, a skiff will sail ten points into the wind and, being light, will skim the waters in great style. And it's good sport.

This year, I left my guns behind, all but a 32 cal. Flobert that I acquired from George Sills when in Peoria. The bore was in surprisingly good condition considering the age of the gun—50 years or so—and, anxious to try it out, I managed to locate some cartridges. Fired it and found it true to the mark—a good target rifle. Thanks at lot, George!

Back on the job to find Doc in the hospital, so that leaves me with nothing to do but get out the book. A visit from Geo. Brown of Atlanta, but rush of work precluded hospitality. Another time, George. Al Schmidt dropped in, and in my preoccupation I took him for Mike Radecki. (I must 'a' been punch drunk.) A call from George Tegen, Fond du Lac, with greetings from Fred Kessenich, Madison, inviting me to their joint meeting, Sept. 12. Sorry—can't make it a/c the R.R. refused to speed the train from Boston the 11th. But then, the Badgers will have a better speaker.

And that winds me up to the last

ASTEely yours

### BULLETINS AND TRADE LITERATURE

Items briefed herein have been carefully selected for their interest and application. Unless otherwise stated, all are available, free, from the stated sources.

Bulletin 503, describing its new line in Economy type standard pedestal spot relders, is available from PROGRES-SIVE WELDER CO., 3050 E. Outer Dr., Detroit 12. Equally adaptable for miscellaneous spot welding and for high production work, these welders are available in 30, 50, and 75-KVA sizes and in 18, 24, and 30-inch throat depths.

A 10-page Catalog of Light Gage Resistance Welders is available from WELDEX, INC., Dept. K, 7338 Mac-Donald Ave., Detroit 10. The complete line of bench and floor models is desaribed, from 1-KVA to 7-1/2-KVA size.

HALLER MACHINE & MFG. CO., INC., 7940 Tireman Ave., Detroit 4, recently issued a bulletin on the Haller Model D-611 Scrap Cutter, a compact, ram-driven unit, to be used on punch press. This unit will help increase value of scrap and cut handling costs.

MANHEIM MFG. & BELTING CO., Manheim, Pa., recently announced a new Veelos Link V-Belt Catalog. Complete instructions are given for ordering, assembling, and installing Veelos V-Belts. Using reels of 8 standard widths, belts of any length may be quickly made up to fit any particular machine.

NIAGARA MACHINE & TOOL WORKS, 637-697 Northland Ave., Buffalo 11, N. Y., recently released a 12-page bulletin on the Niagara Electronic Automatic Welding Machine, which employs the variable-speed Lincoln Welding Head, and features variable-speed traveling column, track for any length job, and power elevating beam.

A 48-page handbook, Besly - Titan Abrasive Wheels, has been issued by CHARLES H. BESLY AND CO., 118-124 N. Clinton St., Chicago 6. Valuable information is given on the construction and uses of abrasive wheels, porosity control, and types and uses of coolants, and lists the types of Besly grinding wheels.

THE GAUGE AND TOOL MAKERS' ASS'N of Great Britain, Standbrook House, Old Bond St., London, W. 1, England, is offering TOOL ENGINEER readers its 1947 Export Catalogue, a comprehensive buyers' guide to products manufactured for export by Association members throughout the British Commonwealth.

HY-LEVEL SCREW PRODUCTS CO., 2114 W. Superior Ave., Cleveland 13, Ohio, has issued a bulletin on the Hy-Level liquid pressure Bar Feed Attachment, which may be used with most single-spindle, automatic screw machines, using the same pump and coolant used on the job, and feeding stock directly into the collet, doing away with feed fingers and ball races.

A. W. CASH VALVE MFG. CORP'N, 666 E. Wabash Ave., Decatur 60, Ill., has listed advantages of their Type A-31 small volume pressure reducing and regulating valve in *Bulletin No. 199*. This valve, one of many types made by the company, is designed for use on humidifiers, spray paint outfits and similar services using water and air.

PRATT & WHITNEY DIV'N, Niles-Bement-Pond Company, West Hartford I, Conn., has issued a brand new catalog covering P & Woil Country Gages. These gages, which may be seen in booth No. 55, the Machine Tool Show, are closely tied in with the American Petroleum Institute's Standardization Program. Pratt & Whitney were selected, by the Institute, to make the Master Gages, the whole making a rather interesting story, told in the bulletin. Also, by Pratt & Whitney, Circular No. 492, covering the P & W Model "C" 1-1/4" × 18" Full-Automatic Centering Machine. While not a new machine basically, the tool has been completely redesigned.

MUELLER ENGINEERING, 1116 Book Bldg., Detroit 26, has issued a new Catalog illustrating the Mueller line of Hydraulic Piercing Equipment. The catalog not only shows a wide diversity of hydraulic tools of unusual design, but numerous applications.

A new Bulletin—J-547—by M. E. CUNNINGHAM COMPANY, 169 East Carson St., Pittsburgh 19, Pa., features a line of "Safety" Marking and Stamping Tools widely applicable to almost every industrial purpose. All of these tools are made of the company's Mecco Alloy Steel, which eliminates mushrooming and spalling.

ILLINOIS TOOL WORKS, 2501 North Keeler Ave., Chicago 39, announces a new booklet containing tooling recommendations for the production of *Involute Splines* in accordance with the recently adopted American Standards for Involute Splines, B 5.15-1946. Entitled "Involute Spline Cutting Tools," the booklet deals with the basis principles involved in tooling and specifies proper hobs, shaper cutters and broaches.

THE BRIDGEPORT SAFETY EMERY WHEEL CO., INC., Bridgeport, Conn., has issued a very comprehensive Catalog showing the company's line of Grinding Machinery and Grinding Wheels. Write for General Catalog No. 147

Information on seal testing by vacuum and by lightwave is presented in *Bulletin 462* from **ACME SCIENTIFIC CO.**, 1450 W. Randolph St., Chicago 7.

COMMERCE PATTERN FOUNDRY & MACHINE COMPANY, 7450 Melville, Detroit 17, has issued a series of circulars describing the Micro-Poise Balancing Machines.

Di-Acro Catalog No. 47-12, by O'NEIL-IRWIN MANUFACTURING COMPANY, Lake City, Minn., is an entirely new edition giving up-to-theminute information on the Di-Acro System of Die-Less Duplicating. The 40-page catalog contains illustrations and specifications covering all Di-Acro Benders, Brakes, Shears and Rod Parters, along with many "on the job" photographs. O'Neil-Irwin products will be displayed at the Machine Tool Show, booth No. 13-A.

FEDERAL PRODUCTS CORPORATION, 11:44 Eddy St., Providence, R. I., has issued a 12 page bulletin describing the new Federal-Metricator Dimensional Air Gage. The bulletin emphasizes the particular uses of this gage which, with other Federal measuring instruments, may be seen at the Machine Tool Show, booth No. 47.

Bulletin No. 326, by THE NATIONAL SUPPLY COMPANY, (Box 899-A) Toledo, Ohio, describes the *Ideal Steam Slush Pump*, Type S-395. The bulletin carries 8 photographs, a blueprint, performance chart and complete specifications.

BURG TOOL MFG. CO., Dept. TE, 5028 W. Jefferson Blvd., Los Angeles 16, is distributing a 4-page bulletin on Tool-Flex Flexible Tool Folders, which feature neoprene mounting, positive drive, and oil resistance.

CHESTER HOIST CO., Lisbon, Ohio, has a 16-page Catalog G 558, covering their line of Spur Geared (high speed) and Differential Chain Hoists, together with their Army Type Low Headroom Timken Equipped Trolley Hoists. Copy of bulletin available when requested on company letterhead.

HOMER MFG. CO., INC., Lima, Ohio, has a folder, Select Homer Permanent Magnets! showing many uses for their line of permanent magnet separators in elimination of tramp iron and steel particles in processing such materials as plastics, paper pulp, textiles and chemicals.

LISBON HOIST & CRANE CO., Lisbon, Ohio, has a folder, Bob-Cat—A Super Line Electric Cable Hoists, which includes cross-sections of the Bob-Cat line of Electric Cable Hoists and pertinent engineering data. Copy available when requested on company letterhead.

### COPY!

"Let your Light so Shine"

This Free Lance Writer, Planner and Editor of long experience, member of ASTE, could prepare your Manual, Catalog or Promotional Specifications and probably save you time and money—your office or mine.

C. F. WORFOLK
ALGONAC, MICH.

(Algonac is near Detroit)

## TOOLS OF TODAY

#### **New Grinding Machine**

The Hill Acme Company, 6449 Breakwater Ave., N.W., Cleveland 2, Ohio, has introduced a line of 2-Roll Vertical ABRASIVE BELT GRINDING AND POLISHING MACHINES for flat polishing of ferrous and non-ferrous metals and other materials. The machines are available in three general types: (1) Strip Type for processing strip material in coiled form; (2) Plate or Bar Type which incorporates the use of feed or pinch rolls for conveying the material under the polishing head; and (3) Sheet Type with reciprocating hydraulic table drive.

Machines, constructed of welded steel in all principal parts, are built in a progression of widths up to a maximum of 60". Endless coated abrasive belts 10' 6" long are utilized on all units and this short belt has definite economical advantages over 20' 3" belts used on previous models.

The 2-Roll Vertical polishing head is the same for all three types and covers, basically, a dynamically balanced upper steel idler roll and a lower rubber covered contact or work roll, over which the abrasive belt travels. The rubber covered contact roll, being the driver, eliminates slippage of the abrasive belt and thereby increases belt life. A steel billy roll, located directly below the contact roll, is raised and lowered through the employment of air cylinders. "Hill" penumatic belt centering device assures positive tracking of the belt, irrespective of dust, moisture or other disturbing conditions. This is the nucleus around which are built the appurtenances necessary to adapt each type of machine to a specific purpose.

Both the Plate and Strip Type machines can be adapted for multi-stage processing, whereby a group or battery of machines (small photo) can be placed in series for continuous polishing. Complete information on these cost saving tools is available from the manufacturer.

T-9-1

#### New Die Casting Machine

A new size and style of heavy duty hydraulic operated **DIE CASTING MACHINE**, designated Model HD-302 and convertible from normal cold chamber operation to optional hot chamber operation, is announced by the H. L. Harvill Manufacturing Company, Corona, Cal.

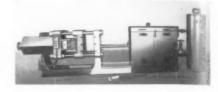
As a cold chamber machine (upper photo), the equipment normally casts aluminum, magnesium and copperbase alloys, also zinc, tin and lead alloys. These alloys are hand-labeled by the operator from a holding furnace ad-

jacent to the machine into the "cold-chamber" injection assembly. Up to 300 "shots" or injections, under pressure ranging from 3400 to 11,800 psi, of molten metal may be made per hour.

By installation of a special self-contained conversion unit, consisting of a holding furnace beneath the injection cylinder; a blower and temperature control unit; a metal pump assembly with motor; and a hot chamber injection assembly, (lower photo) the machine is converted from hot chamber to cold chamber—or vice versa—in less than 30 minutes. The injection assembly is not immersed in the molten metal, consequently is not subject to deterioration as in the case of ordinary "gooseneck" assemblies.

Below, the Hill-Acme Grinder.





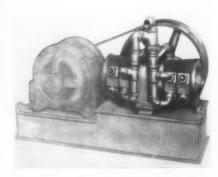


With the conversion unit, the machine casts zinc, tin and lead alloys by the hot chamber method, and operation may be (as either cold or hot chamber) fully manual or semi-automatic. Controls of machine motion are time-cycle controlled, push button start. Vickers hydraulic equipment is used throughout, and the hydraulic system provides minimum servicing time for maintenance.

T-9-2

#### New Type Compressor

A new OSCILLATING AIR COM-PRESSOR, said to be revolutionary in design, is announced by Associated Engineers, Inc., Las Vegas, Nevada. A feature of the unit is that it has only four major driving parts, yet delivers an unusually large volume of air with comparatively low horsepower and at low speed.



Each cylinder is divided into four components by means of two stationary vanes, and one oscillating rotor fixed to the rotor shaft, thereby rendering 8-cylinder performance. For every revolution of the crankshaft, eight power outputs are produced, the equivalent of the displacement of both cylinders.



## Vertical Stroke Grinder

recent development of the O. S. ker Company, Inc., Worcester, Ss., is the highly flexible Walker RTICAL STROKE GRINDER. This chine, which can be used for either sproduction or small lot grinding, nures a work table that may be tilted to right 15° or front to back 7°. Jus, flat grinding and concave or concx grinding up to 15° is possible.

The hydraulic-actuated head travels



at rapid traverse to working position; from there on, the positive grinding feed is controlled entirely by foot treadle through the complete operating cycle. This leaves the operator's hands free for quick loading and unloading. A 12" Walker Rotary Magnetic Chuck, with 1½" center hole, provides for work to be automatically magnetized on the downward stroke and demagnetized on the up travel, with no manual time involved.

### Hi-Boy Lubricator for Tapping

The new HI-BOY LUBRICATING PUMP is a feature of the new series of

Universal Tapping Machines, by Procunier Safety Chuck Co., 18 S. Clinton St., Chicago 6, Ill. This continuous flow pump is of the motor driven gear type, supplying lubricants to the tap not only during tapping but while the tap is backing out as well. This point is particularly important in making deeper cuts in tapping the tough-

er metals. Sizes available are Series A —from #2 tap up to 5/16'' in steel to 38'' in cast iron, and 12'' in brass—and Series D—from #10 tap up to 12'' in steel, 58'' in cast iron, and 34'' in brass. T-9-5



## **Economy Shoplifter**



The Economy SHOPLIFTER, by Economy Engineering Co., 2653 W. Van Buren St., Chicago 12, is available as either a hand-operated or electric unit. Originally designed to handle dies and shop fixtures, the versatile Shoplifter can be used for many heavy lifting jobs, such as raising heavy workpieces to table level of a production machine. Loads up to 500 lbs. can be handled safely by one person.

T-9-6

## Use This Coupon for Complete Information on "Tools of Today"

For your convenience, every item appearing in the popular Tools of Today feature of *The Tool Engineer* is now keyed and further information easily obtained by checking the handy request form below.

Keep abreast of current developments—know what new tools are being marketed to increase production and step up efficiency—turn back now to the start of the Tools of Today feature for this month. Further information on any or all of the items shown can be obtained by circling the corresponding numbers on the form below, and mailing it to The Tool Engineer.

This month, thirty-three different items are described, covering every type of shop operation. Many of them are new products which alert plants will employ immediately to combat today's rising production costs. Others will be of tremendous help in attaining new heights of production accuracy. In every case, you will find "Tools of Today" worthy of your attention and an aid in keeping you abreast of the constant flow of new machines and appliances which are being placed on the market.

For your protection, "Tools of Today" items are checked and re-checked by the technical editors of *The Tool Engineer* so that performance data and other information will be accurate and dependable. Tools of Today Department THE TOOL ENGINEER 550 West Lafayette Blvd., Detroit 26, Michigan

### Gentlemen:

Please send me further information on the following *Tools* of *Today* items which I have checked:

T-9-1	T-9-2	T-9-3	T-9-4	T-9-5	T-9-6
T-9-7	T-9-8	T-9-9	T-9-10	T-9-11	T-9-12
T-9-13	T-9-14	T-9-15	T-9-16	T-9-17	T-9-18
T-9-19	T-9-20	T-9-21	T-9-22	T-9-23	T-9-24
T-9-25	T-9-26	T-9-27	T-9-28	T-9-29	T-9-30
T-9-31	T-9-32	T-9-33			

Name

Firm

Address

City State

## DoAll Selector

The DoALL SELECTOR, a product of the DoAll Company, Des Plaines, Ill., offers complete automatic inspection and segregation of small parts into three classifications—oversize, acceptable, and undersize. Fully automatic, with semi-automatic feed mechanisms available, and accurate to .00001", the tool will sort parts with tolerances from  $\pm$  .0001 to  $\pm$  .005 at speeds limited only by the rate at which parts can be fed into the selector. Up to 12,000 parts per hour have been attained.



Model DS-20, which may be set in Just a few minutes, using gage blocks, comes as a packaged unit, includes the gage head, master control, segregator, gage head stand, table, chair, and three tote pans. The gage head has no moving parts, coils, switches, or magnets to need adjustment. The master control indicating lights, in addition to a graduated indicating dial gage which provides exact reading of each part as it is sorted.

Optional equipment includes an electrical counter for counting the number of acceptable, oversize, and undersize pieces and a hearing aid for efficient operation of the selector by a blind person. The selector is adaptable for measuring I.D.'s and for simultaneous checking of more than one dimension. In addition to the DS-20, three other packaged units are available.

T-9-7

## New 36" Broaching Machine

A new double-cylinder 36" stroke HYDRAULIC BROACHING MACHINE, by Zagar Tool, Inc., 23880 Lakeland Blvd., Cleveland 17, Ohio, reduces setup time to a minimum. A job may be set-up at either end, one loading and unloading while the other is broaching, thus practically doubling output. Extremely slow ram speeds, with hairline selection, is provided by controls



conveniently grouped on a recessed in-

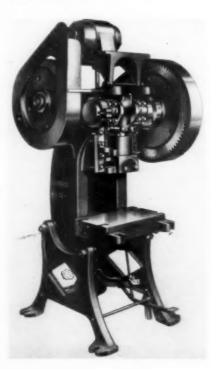
An oil control valve insures ample pulling power—16,000 pounds—without loss of power, and valve clogging is eliminated by use of a Cuno oil filter. Compact and sturdy, the new broaching machine saves valuable floor space and leaves ample room for the operator, who works without chip interference or oil splashing. Double cylinders spread pulling stress and insure smoother operation.

The machines, which are equipped with 220/440-volt, 3-phase, 60-cycle motor, is available for immediate delivery. Full details in Zagar Catalog TE-6.

T-9-8

## New Back Geared Press

A new, back-geared 31-Ton PUNCH PRESS, with design features adapting it to many shop requirements, is announced by Diamond Machine Tool Company of Los Angeles. It differs from the former 30-Ton model by the addition of the back gears, illustrated, and in even stronger frame design. Bed area from front to back is 13" and from right to left 22". Standard stroke is 3" although shorter or longer strokes can be provided. Overload protection is rated at 100%.



The press is mounted on heavy semisteel legs and a cradle arrangement permits operation at any desired degree of inclination. Gibs, sliding surfaces, and crank shaft are micro-finished to provide maximum smoothness of operation and longest possible wearing life, and all stock parts are interchangeable, requiring no special fitting in case replacement becomes necessary. Currently offered for immediate delivery.

T.9.9

## Two-Spindle Radial Bore

A Two-Spindle RADIAL BORER, designed especially for the furniture, plastic, and light metal industries, is now in production at the Moak Machine and Tool Company, Port Huran, Mich. The lightweight, aluminum alloy "Silver Top" is completely enclosed, permitting easy movement of the head to any position from horizontal to vertical, and adjustment of the spindles from 1-1/16" to 12" apart.



With complete elimination of all gears, the spindles operate freely in anti-friction bearings. Both spindles and head can be locked rigidly at any desired setting, and spindle speeds are infinitely variable from 1000 RPM to 4000 RPM. The foot treadle arrangement allows the table to move in or out in a straight line. The position or adjustment of the treadle is not changed by raising or lowering the table by hand wheel.

Automatic air-powered feeding and clamping equipment may be obtained. A fully illustrated catalog is available.

T-9-10

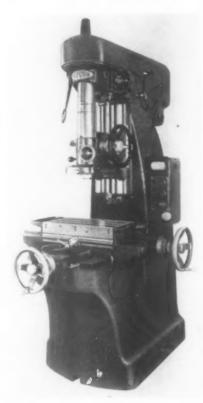
## New Small Logan Lathe



A new LOGAN LATHE, with 9-inch swing, and 18" between centers, offers many of the basic features found in the larger lathe built by Logan Engineering Company, 4901 W. Lawrence Ave., Chicago 30. Economical, high-speed operation, with exacting accuracy, is possible with the well-known Logan ball-bearing spindle mounting. The two V-ways and two flat ways of the bed are precision ground to within .0005" of parallelism. Massive construction insures durability, and steadiness on heavy cuts. Catalog No. 400 gives complete information.

## Larger Moore Jig Borer

A new **JIG BORER**, No. 2 model by Moore Special Tool Co., Inc., Bridgeport, Conn., provides for heavier cuts and larger holes than the No. 1 model, which has proved itself during past years. The new machine will jig-bore holes up to 5" in mild steel or castiron. The table working surface is 10" and a cross travel of 16½", and a cross travel of 10½". The distance from table top to spindle is from 3" minimum to 18" maximum.



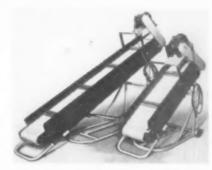
Infinitely variable spindle speeds cover a range from 90 to 2400 RPM. Three power feed ratios—.0015", .003", and .006" per revolution of spindle in either direction—constitute another important feature. Among the features which popularized the No. 1 model and are continued in the present larger machine are the hardened, ground, and lapped lead screws for precise, rapid table settings within .0001" by coordinate location; centralized control; and pre-loaded precision ball bearing spindle.

T-9-12

## Small Press-Veyor

A new, compact, portable power belt conveyor—the PRESS-VEYOR—by Rapids-Standard, is especially designed for use between punch presses where space must be conserved. The conveyor bed of this new unit, which is the smallest of three standard models, is 4 ft. long. Companion models are 6 ft. and 8 ft. long.

While used primarily to convey stampings through punch press operations, and to dispose of scrap, the conveyor also serves admirably as a steepangle conveying unit for miscellaneous products.



The new unit is powered by a 1/3-H.P. gear head electric motor, either 115V-60c-1 phase A.C. or 220V-60c-3 phase A.C., and has a 4-ply, 32-oz. solid woven, interbound cotton belt. A recently developed curved, fabricated metal cleat, designed to hold securely to the conveyor belt, is standard equipment on all three models of the Press-Vevor.

Full information may be had from the Rapids-Standard Company, Inc., Dept. PV—39, 342 Peoples Nat'l Bank Bldg., Grand Rapids 2. Michigan.

T-9-13

## Automatic Multiple Drilling

A specially designed AUTOMATIC DRILLING MACHINE, announced by Snyder Tool & Engineering Co., 3400 E. Lafayette Ave., Detroit, performs in a single automatic cycle a number of drilling operations on truck rear-axle housings. The complete work-cycle, including clamping, drilling 21 holes, and releasing, requires 15 seconds.



Operating in sequence, a movable bushing plate and two individually-actuated hydraulic clamps locate and clamp the workpiece in the fixture. The parts are engaged on the two banjo faces by two opposed pilot diameters—one stationary, the other movable and wedge-locked in place—which enter the banjo face bores. Two opposed Snyder self-contained hydraulic units, each carrying a 10-spindle head, are used to drill the 10 holes in each banjo face, while a single-spindle unit, mounted on an inclined angle, is used to drill the breather hole.

The machine features hydraulic feed to all tools, stub-tooth gear trains in the drill heads, and fully-automatic work cycle.

T-9-14

## **Small Clearing Presses**

Clearing Machine Corporation, Chicago, is expanding its line to include the new straight-sided SERIES "S" PRESSES, ranging from 60 tons up to 250 tons, considerably smaller than those heretofore manufactured by the company. While built to the same high standards of workmanship, the new line incorporates numerous departures from previous designs.



The Series "S" frames are all welded steel, which permits a broad range of dimensions without seriously affecting the prices. Bed widths, right to left, range from 36" to 108" in increments of 6" and 12"; bed depths, front to back, range from 28" to 44"; stroke lengths vary from 3" or 4" to as long as 16" to 18"; and shut heights are similarly of wide range.

Slide adjusting mechanism can be operated by hand, or by electric motor provided with a magnetic brake. An outstanding feature is the air friction clutch interlocked with a spring-actuated brake, electrically operated by push buttons.

T-9-15

## Doubletone Tracing Vellum

Craftint DOUBLETONE TRACING VELLUM, by the Craftint Manufacturing Company. East 152nd St. at Collamer Ave., Cleveland 10, Ohio, provides a quick, easy way to shade art, do cross-hatching, trace finished art, and reproduces more economically. Hidden screens permit the application of a special colorless chemical to quickly bring up tones from the sheet.

Craftint Doubletone Tracing Vellum is available in two types: (1) Regular—for preparing tracings for reproduction by contact printing, Blue Print, Ozalid, or similar methods, and (2) O. S.—for preparing tracings to be photographed and reproduced.

## DoAll Selector

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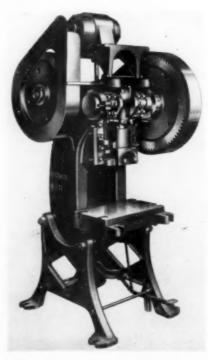
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T-9-9

## Two-Spindle Radial Borer

A Two-Spindle RADIAL BOREM designed especially for the furniture plastic, and light metal industries, now in production at the Moak Machine and Tool Company, Port Huro-Mich. The lightweight, aluminum aloy "Silver Top" is completely enclosed, permitting easy movement of the head to any position from horizontal to vertical, and adjustment of the spindles from 1-1/16" to 12" apart.



With complete elimination of all gears, the spindles operate freely in anti-friction bearings. Both spindles and head can be locked rigidly at any desired setting, and spindle speeds are infinitely variable from 1000 RPM to 4000 RPM. The foot treadle arrangement allows the table to move in or out in a straight line. The position or adjustment of the treadle is not changed by raising or lowering the table by hand wheel.

Automatic air-powered feeding and clamping equipment may be obtained. A fully illustrated catalog is available.

T-9-10

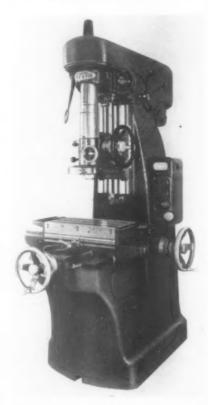
## New Small Logan Lathe



A new LOGAN LATHE, with 9-inch swing, and 18" between centers, offers many of the basic features found in the larger lathe built by Logan Engineering Company, 4901 W. Lawrence Ave., Chicago 30. Economical, high-speed operation, with exacting accuracy, is possible with the well-known Logan ballbearing spindle mounting. The two V-ways and two flat ways of the bed are precision ground to within .0005" of parallelism. Massive construction insures durability, and steadiness on heavy cuts. Catalog No. 400 gives complete information.

## Larger Moore Jig Borer

A new **JIG BORER**, No. 2 model by Moore Special Tool Co., Inc., Bridgeport, Conn., provides for heavier cuts and larger holes than the No. 1 model, which has proved itself during past years. The new machine will jig-bore holes up to 5" in mild steel or castiron. The table working surface is 10" x 19", with a longitudinal travel of 16½", and a cross travel of 10½". The distance from table top to spindle is from 3" minimum to 18" maximum.



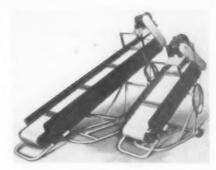
Infinitely variable spindle speeds cover a range from 90 to 2400 RPM. Three power feed ratios—.0015", .003", and .006" per revolution of spindle in either direction—constitute another important feature. Among the features which popularized the No. 1 model and are continued in the present larger machine are the hardened, ground, and lapped lead screws for precise, rapid table settings within .0001" by coordinate location; centralized control; and pre-loaded precision ball bearing spindle.

T-9-12

## Small Press-Veyor

A new, compact, portable power belt conveyor—the **PRESS-VEYOR**—by Rapids-Standard, is especially designed for use between punch presses where space must be conserved. The conveyor bed of this new unit, which is the smallest of three standard models, is 4 ft. long. Companion models are 6 ft. and 8 ft. long.

While used primarily to convey stampings through punch press operations, and to dispose of scrap, the conveyor also serves admirably as a steepangle conveying unit for miscellaneous products.



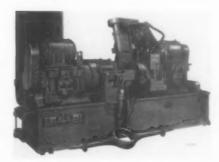
The new unit is powered by a 1/3-H.P. gear head electric motor, either 115V-60c-1 phase A.C. or 220V-60c-3 phase A.C., and has a 4-ply, 32-oz. solid woven, interbound cotton belt. A recently developed curved, fabricated metal cleat, designed to hold securely to the conveyor belt, is standard equipment on all three models of the Press-Veyor.

Full information may be had from the Rapids-Standard Company, Inc., Dept. PV—39, 342 Peoples Nat'l Bank Bldg., Grand Rapids 2, Michigan.

T-9-13

## **Automatic Multiple Drilling**

A specially designed AUTOMATIC DRILLING MACHINE, announced by Snyder Tool & Engineering Co., 3400 E. Lafayette Ave., Detroit, performs in a single automatic cycle a number of drilling operations on truck rear-axle housings. The complete work-cycle, including clamping, drilling 21 holes, and releasing, requires 15 seconds.



Operating in sequence, a movable bushing plate and two individually-actuated hydraulic clamps locate and clamp the workpiece in the fixture. The parts are engaged on the two banjo faces by two opposed pilot diameters—one stationary, the other movable and wedge-locked in place—which enter the banjo face bores. Two opposed Snyder self-contained hydraulic units, each carrying a 10-spindle head, are used to drill the 10 holes in each banjo face, while a single-spindle unit, mounted on an inclined angle, is used to drill the breather hole.

The machine features hydraulic feed to all tools, stub-tooth gear trains in the drill heads, and fully-automatic work cycle.

T.9.14

## **Small Clearing Presses**

Clearing Machine Corporation, Chicago, is expanding its line to include the new straight-sided SERIES "S" PRESSES, ranging from 60 tons up to 250 tons, considerably smaller than those heretofore manufactured by the company. While built to the same high standards of workmanship, the new line incorporates numerous departures from previous designs.



The Series "S" frames are all welded steel, which permits a broad range of dimensions without seriously affecting the prices. Bed widths, right to left, range from 36" to 108" in increments of 6" and 12"; bed depths, front to back, range from 28" to 44"; stroke lengths vary from 3" or 4" to as long as 16" to 18"; and shut heights are similarly of wide range.

Slide adjusting mechanism can be operated by hand, or by electric motor provided with a magnetic brake. An outstanding feature is the air friction clutch interlocked with a spring-actuated brake, electrically operated by push buttons.

T-9-15

### Doubletone Tracing Vellum

Craftint DOUBLETONE TRACING VELLUM, by the Craftint Manufacturing Company, East 152nd St. at Collamer Ave., Cleveland 10, Ohio, provides a quick, easy way to shade art, do cross-hatching, trace finished art, and reproduces more economically. Hidden screens permit the application of a special colorless chemical to quickly bring up tones from the sheet.

Craftint Doubletone Tracing Vellum is available in two types: (1) Regular—for preparing tracings for reproduction by contact printing, Blue Print, Ozalid, or similar methods, and (2) O. S.—for preparing tracings to be photographed and reproduced.

## **New Blueprint Equipment**

Paragon-Revolute Corporation, Rochester, N. Y., announces new, ultra modern FINISHING AND BLUE-PRINTING EQUIPMENT, designed to improve quality and to effect matched economies in printing and finishing. The Finisher (upper photo) is designed to handle all known ammonia type diazo papers and specialties, to be flexible in operation, and free from trouble-some breakdowns.





The Revolute M-4 Automatic Blueprinting Machine (lower photo) is the latest development in continuous yardage automatic blueprinting equipment. Among numerous features, this unit incorporates the Revolute revolving contact principle to provide slip-free and static free contact between the tracing and the sensitized material—in other words, the tracings "ride" instead of slide.

Both of these units have too many features and improvements to be listed here, and company executors desirous of modernizing their blueprinting and finishing facilities should write Revolute for information.

T-9-17

### Power Press Brake

A motor-driven slide adjustment, with both motor and controls readily accessible, is an important feature of the Columbia POWER PRESS BRAKE produced by Columbia Machinery and Engineering Corporation, Hamilton, Ohio. The slide can be adjusted out of parallel with the base, the magnitude of the adjustment showing on indicators located on each end. The brake, which is operated by a multiple-disc friction clutch, of special Columbia design, is a highly-efficient friction brake, engineered for

strength and rigidity, with maximum permissible deflection held to .001" per inch of machine width.



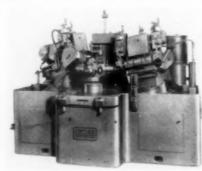
Of special interest, the first driving gears are helically cut, adding materially to the life of the machine besides giving smoother operation. Eccentrics are forged integrally with the eccentric shaft, which is of heat treated high carbon steel, and all main bearings are lubricated by a positive centralized system.

The brake, which is of 120 tons capacity, operates at 30 strokes per minute and will form mild steel in the following sizes: 7/16 in. x 4 ft.; 5/16 in. x 6 ft.; ¼ in. x 8 ft. and 3/16 in. x 10 ft.

T-9-18

### New Cross Grinder

A SPECIAL GRINDER for grinding teeth in spring clutches from the solid and simultaneously chamfering one side has been developed by *The Cross Company*, 3250 Bellevue, Detroit. Production of 200 eight-tooth clutches net, per hour, is claimed for one operator.



A 3-station turret power indexes the workpieces from station to station. The first station is for loading and unloading, the second for grinding the teeth, and the third for chamfering. In addition to turret indexing, the parts automatically index on their own axis at each station from one tooth to the next.

When the work clamping lever is released, the work stops rotating, thus providing for quick, easy loading and unloading. The grinding wheels are automatically dressed, between indexes, and size is maintained by automatically compensating for the amount dressed from the wheel. The machine is completely universal within its range, with provision for various numbers of teeth as well as for a variety of tooth sizes and angles.

T.9-19

## New Metal Saw

A new heavy-duty horizontal MET-AL-CUTTING BAND SAW, named the Wells No. 12 features automatic cutting cycle in which the blade is fed into the work, at constant pressure, with the cutting head returned by hydraulic power to starting position upon completion of the cut. Elimination of manual operations reduces operator fatigue and makes possible higher production, while control of blade pressure is claimed to result in a better cut and greatly reduced blade breakage.



Developed by Wells Manufacturing Corp., Three Rivers, Michigan, the saw is designed for cutting off rectangular stock up to 12" deep by 16" wide or cylindrical stock up to 12¾" diameter. In addition to through cutting, the saw can be automatically controlled to cut to any desired depth for work on dies or other parts.

The saw, with cutting speeds 50, 90, or 150 f.p.m., is heavily and rigidly constructed, with cast bed and base, the latter enclosing the hydraulic system. The cutting head rides on closely fitted rollers, on two heavy columns, and the saw blade is enclosed except at the cutting zone. Vise is quick-acting type.

T-9-20

### Zero Precision Lathes



The Sheldon Machine Co., Inc., 4258 N. Knox Ave., Chicago 41, recently added to its line of S-56 lathes the TRB S-56, incorporating "Zero Precision" tapered roller bearings for greater precision. Designed to meet the most exacting requirements, this model has a 11¼" swing and 1" collet. The bed is 56" long, and 35" between centers.

## **Grenby Hydraulic Grinders**

Grenby Manufacturing Company, Plainville, Conn. announces two new YDRAULIC GRINDERS-A Univer-External Grinder EG-103 (upper hoto) and a Universal Internal Grinder G-103. Either machine can be equipped with two heads to make a combination external-internal grinder. The respeclive recommended capacities are: Exernal 3" diameter x 10" long between centers; internal 3" diameter x 4" long. Both can actually grind work up to the full swing over the table of 9" diameter and, while primarily tool room equipment, the machines may be successfully used for precision production grinding.





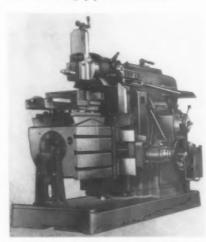
A live spindle work head takes 5C-1" collets, swivels 90 degrees either side of center, and has taper bayonet lock spindle nose for 3 and 4 jaw chucks, face plates and dead center attachment. The grinding wheel head swivels 15 degrees and a 34-HP motor, mounted in rubber, drives the 10" x 1" external wheel or the 15,000 RPM and 32,000 RPM internal spindles.

Hand and power cross feed in .0001" are standard equipment. Ways are hand scraped .0002" flat and square and are automatically oiled from the hydraulic system. The table had infinite speed changes from 0" to 100" per minute and oscillates a full 10" or as little as 1/32" stroke.

T-9-22

## Improved Gemco Shapers

Four new features, now embodied in Gemco MULTI-PURPOSE SHAPERS, include control of the power rapid traverse, 4-way control of selective feed on power rapid traverse, a column mounted oil pump, accessible from the outside, and a column mounted filter, which, because of its accessibility, may be removed for complete cleaning without disturbing pipe connections.



Control of the power rapid traverse is now easily accomplished by an operating lever, conveniently placed. The lever operates a positive type clutch which normally engages the feed power to drive the work table. Shifting the lever engages the clutch with the rapid traverse and moves the table automatically away from the workpiece-or opposite to the direction of feed power-thereby making it unnecessary for the operator to shift gears. The four-way control, for either horizontal or vertical movement of the work table, is easily obtained by means of a simple gear shifting device at the operator's side of the cross rail. The hand wheel, normally used to accurately position the workpiece, also functions as a gear shifting device. Pushing the hand wheel into an outward position engages the vertical feed; pushing it inward engages the horizontal feed. When employed, vertical feed is geared down to approximately 1/12th of the normal horizontal feed range.

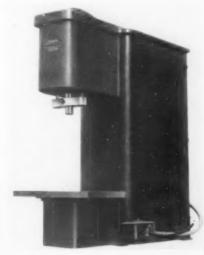
Full information on this versatile and convenient tool may be had from General Engineering & Manufacturing Company, 4417 Oleatha Ave., Dep't TE, St. Louis 16, Mo.

T-9-23

## Air-Hydraulic Press

The new Hapco AIR-HYDRAULIC PRESS, for all types of operations, is announced by Hy-Air Products Company, 1707 W. Michigan Ave., Jackson. Michigan. Designed with an entirely different operating principle, the new press is said to offer many advantages in lower cost operation and higher efficiency. The power mechanism has only one moving part which floats on a cushion of oil, thus providing smoother, more easily controlled action. Air con-

sumption is reduced to approximately half the usual consumption for other presses of equal capacity. The entire mechanism is contained within the housing.



A double acting hydraulic cylinder, built as an integral part of the air piston, permits reduction in oil pressures of approximately 50% over conventional operating pressures. The elimination of many moving parts, and sealing by means of standard "O" rings, reduces maintenance costs to a new low. Because of an efficient self-bleeding action, the press can be started with the hydraulic system full of air, yet will bleed itself completely.

T-9-24

## Cylinder Boring Machines

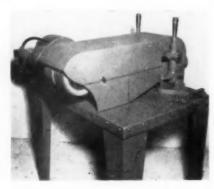
Ex-Cell-O Corp'n, 1200 Oakman Blvd., Detroit 6, has developed a line of precision CYLINDER BORING MA-CHINES for the automotive industry.



Engine blocks move from the conveyor line to a suitably designed fixture on the boring machine where they are located, clamped, and precision bored. After being bored, the blocks are unclamped and in position to continue on the conveyor. The present line includes both angular machines for straight or V-type blocks and vertical machines for in-line blocks. These machines are fully described in Vol. No. 22, No. 4 issue of Ex-Cell-O Tool Tips, available on request.

## **New Belt Grinders**

Two new **BELT GRINDERS**, by the *Porter-Cable Machine Company*, Syracuse, N. Y., include the Model DBS, Double Belt Bench Grinder (small photo), and the "C-6", the latter designed for grinding-polishing contoured parts.



The Bench Grinder mounts two sturdy 7" diameter x 2½" wide resilient contact rolls, located side by side, and only inches apart, each aligned with an idler adjustable for abrasive belt tensions, tracking and lining up with the contact roll. The two endless metal cutting abrasive belts (2½" wide x 60" circumference) provide a two-station grinder, one of which can be fitted with a coarse abrasive belt for rough grinding, the other with a fine grit for finish.



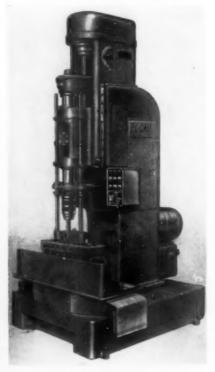
The "C-6" is designed for grindingpolishing of contours and, to overcome the difficulties usually encountered in contour grinding, the machine incorporates a flexed abrasive belt that approaches and leaves a formed contact well at a slight angle. Thus, the abrasive belt "drapes" itself into the pat-terns on the roll and grinds-polishes the pattern sharply with the speed, beauty and economy characteristics of abrasive belt machining. The pattern is turned into the contact roll which, in the P-C machines, are made of sisal and latex. The roll holds a pattern indefinitely, yet is slightly resilient for fast, smooth grinding.

T-9-26

## New Microhoning Machine

Micromatic Hone Corporation, Detroit, announces a newly developed, unit-constructed, single-spindle, heavyduty MICROHONING machine with quill type spindle for Microhoning bores from 1" to 4" diameter up to 9½" long.

These machines, which provide an important expansion of work size capacity and simplify operation and maintenance of high production type Microhoning machines, are made up with the following three units assembled on the column and base of any other Micromatic Microhoning machine: (1) The Head Unit: The spindle, hydraulic control panel, stroke control mechanism, and speed control transmission are all in one integral assembly; (2) The Hydraulic Unit: This comprises the hydraulic pump, tank, and pressure control valves; (3) The Electrical Unit: The Electric Control Panel.



Because all weight that must be reciprocated to stroke the tool has been minimized, there is faster stroking without increased power input, and faster stock removal. All head and guide bars have been eliminated. The spindle is the piston rod, with stroke control more positive and accurate because it is direct, without linkages or levers. Accurate spindle alignment with the work is assured because torque and thrust is taken by the quill closely above the tool.

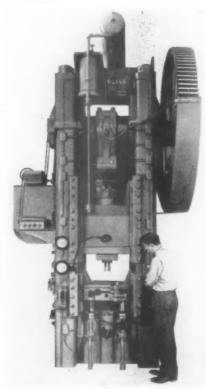
Most Microhoning production type machines are purchased to process one particular part, and are usually fixtured to accommodate the particular characteristics of each part. With the new unit design, however—here shown with a lateral indexing fixture for microhoning automotive cylinder bores—

greatly increased adaptability of production tooling is possible since these machines may be assembled around the most adaptable column, fixture and base as required by the part. This permits requirements formerly eonsidered special to be easily met by some combination of these standard assemblies.

T-9-27

## New Briquetting Press

A new BRIQUETTING PRESS—No. 309—that extends metal powder application to large, irregular cross- sections, developed by the E. W. Bliss Company, 450 Amsterdam Ave., Detroit 2, embodies a unique operating principle which combines the advantages of triple hydraulic lower motion—floating die table, core rod, and stripper—all built into a 345-ton mechanical press. This press produces large, complex powdered metal parts beyond the size range and capacity of available single-action mechanical or hydraulic presses, and to close tolerances.



Uniform density throughout the finished part is assured by the hydraulically controlled floating die table and core rod rams, which recede against pressure that is pre-determined by simple, independent adjustments. In effect, this squeezes the powder from top and bottom.

The mechanically actuated slide, which carries an adjustable cam to actuate the movement of the powder hopper, has a 10" stroke which can be adjusted to 5". The speed of the slide can be adjusted from 6 to 9 strokes per minute and from 9 to 18 strokes per minute by adjusting the speed control of a variable speed motor.

## **Automatic Punch Press**



A 10-ton Diebel **HI-SPEED AUTO-MATIC PRESS**, by the *Di Machine Corp'n*, 2711 W. Irving Park Rd., Chicago 18, features automatic roll feed and variable speed drive, permitting operation between 65 and 300 strokes per minute. Standard die sets measuring to  $8\frac{1}{2}$ " x  $6\frac{1}{4}$ ", or special die sets to 8" x 12" can be accommodated. Shut height is 6". Stock to  $4\frac{1}{2}$ " wide may be used, and the length of feed is adjustable to 6". Accurate feeding is provided for the use of progressive dies.

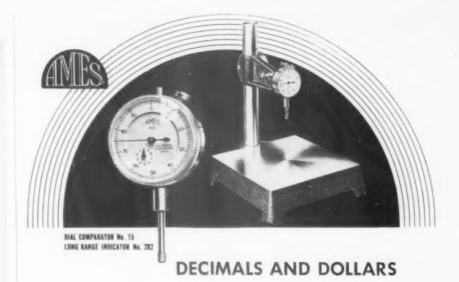
T-9-29

## Carbide Tool Grinder



An improved type of CARBIDE TOOL GRINDER has been added to the line of Baldor Electric Company, St. Louis, Mo. This unit is powered with a ½-H.P. motor, reversible so that right or left hand tools may be sharpened. The machine features a dynamically balanced rotor, mounted on large bearings, with rugged shaft. The rigidity of this construction results in smooth performance needed in precision grinding. Other features include protractor type tool support and large tool tables.

T-9-30



When you want to measure those decimals with maximum dollar savings, do it with an AMES DIAL COMPARATOR such as Model No. 13 shown above. Quickly and easily set to the required dimension. Maintains its setting even with rough usage. Gives instant, accurate readings—independent of the human factor. You'll find no other Comparator gives you such high production while saving so much in time and labor.

The 8"-square cast-iron base may be fitted with V-blocks, anvils, or stops of various kinds. The indicator-holding bracket extends 4" over the base and is easily adjustable on the 9" column. Measuring capacity is 6". Net weight 16 lbs.

The indicator shown is one of a complete line of AMES Long Range Indicators from which you may select exactly the graduations, range, and dial reading best suited to your needs.

Write for information on our full line of Comparators and many other measuring instruments. Address our Home Office: 30 Ames Street, Waltham 54, Mass.



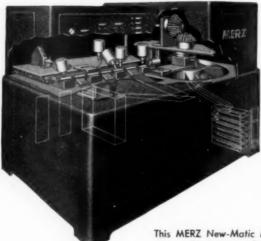
## Milwaukee Profile Grinders The MILWAUKEE PROFILE GRINDER, by Milwaukee Chaplet &



Mfg. Co., Milwaukee, Wisc., is designed specifically for the precision grinding of interior and exterior profiles, and curved, odd, and irregular surfaces. According to information at hand, it permits a high degree of accuracy in finishing hardened steel parts for tools, dies, jigs, and fixtures.

The functional work table has a 4-way tilt up to  $15^{\circ}$ , with angle indicated by graduated dial and pointer. A feature of the machine is a built-in diamond dresser. Other details include spindle speed of 20,000 RPM, and accommodation of wheels from  $\frac{1}{8}$ " to  $1\frac{1}{2}$ ". The tool is said to be extremely rapid for work within its range.

T.9.31



## Here's How MERZ Cuts Inspection Time and Cost

This MERZ New-Matic Measuring Machine checks oversize, undersize, out-of-roundness and taper. Also selects four diameter groups.

• Because it checks oversize, undersize, taper, out-of-roundness and four selected diameter groups, accurately and automatically—without revolving the parts—the MERZ New-Matic Sorting and Gaging Machine provides the speed and smoothness to keep parts inspection in pace with modern mass production.

With its outstanding speed and accuracy, assured by the exclusive MERZ New-Matic principle, this machine is typical of the precision inspection equipment produced by MERZ for all types of checking operations. Write for full details

on how the creative engineering skill and precision craftsmanship available at MERZ can design and build sorting and gaging equipment to reduce materially the time and cost of your most intricate and specialized inspections.

MERZ New-Matic Measuring Machines are extremely fast and accurate, providing the exclusive MERZ principles of "point-to-point gaging" and "balanced-air" control for high-precision inspection. Other models for every checking requirement. Ask for the new 20-page booklet.

MERZ ENGINEERING COMPANY, INDIANAPOLIS 7, INDIANA

VISIT MERZ EXHIBIT - 33F - MACHINE TOOL SHOW



## Pneumatic Riveter

Schlack Manufacturing Compa (1), 13259 Birwood Ave., Detroit 4, 1) - nounces a PNEUMATIC RIVETING MACHINE with interchangeable her is —named the Pneu-Spin—that combines

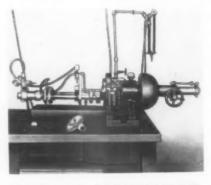
hammer action with rotation and can be applied to assembly of parts made of metal, plastics, porcelain, fibre, and wood. The interchangeable heads are available for rivet capacities to 3/32, 5/32, ½ and 5/16 inch based on soft steel.

The riveter, which is suited to assembly of moving parts, mounts a motor-driven spindle for peening tools to form round, oval or flat heads, to peen shafts, pins, studs; to flare small tubes and brass con-

nectors, and to furl shoulder bushings and light tubes. A pneumatic hammer imparts 4,000 to 6,000 blows per minute with a ¼-inch stroke to the rotating tool, from a 75 to 80-pound air supply. Force and frequency are adjustable. Work is supported by an aluminum pressure pad attachment.

T-9-32

## **Hydraulic Boring Machine**



A self-contained HYDRAULIC BOR-ING MACHINE-the Hydro-Borer, by the Hydro-Borer Company, 511-B So. Redondo Blvd., Inglewood, Cal.-is equipped with a specially designed airoperated fixture which is pedal actuated. Indicative of performance is a job of boring, c'boring and facing a regulator body for butane and protane equipment, shown. Material bored is diecast Zamac 3, and production, at the rate of 120 pieces per hour, is said to have been constant over a period of several months without breakdown Finish is 10 micro-inches. Full information from the maker.

STARRETT EXHIBIT

Booth 200

MACHINE TOOL SHOW

Chicago Sopt. 17-26

PRECISION TOOLS

STEEL TAPES and RULES



See the striking display of STARRETT Precision Measuring Tools including a comprehensive selection of Micrometers, Vernier Gages, Protractors, Squares and other fine mechanic's tools. A highlight of the exhibit. Tapes and Rules for every need and purpose in lengths and graduations to suit every requirement. You'll be amazed at the variety.

DIAL





HACKSAWS and BAND SAWS



Featuring a most complete array of STARRETT and LAST WORD Dial Indicators in all types, sizes and styles of dial graduation. Don't miss this display if you take pride in precision.

See the saws "Made by the World's Greatest Makers of Precision Tools" including hacksaws for hand and machine metal cutting and band saws for cutting metal, wood, plastics, etc.

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PRECISION TOOLS • DIAL INDICATORS • STEEL TAPES • GROUND FLAT STOCK
HACKSAWS • BAND SAWS FOR CUTTING METAL, WOOD, PLASTICS

## North East West South in Industry

Recent appointments by KENNA-METAL, INC., Latrobe, Pa., manufacturer of cemented carbide tools, include Gilbert A. Bunn, Manager of the Middle-Atlantic District, with offices in Philadelphia, Pa.; Charles Herbert Bodner, tool engineer and representative in Los Angeles area; John H. Wright, in New England area; and Richard H. Oberholtzer, in Detroit District. Lundwall & Co., V. Hamngatan 5, Goteborg, will be the distributing representative in Sweden. The Laurent Industrial Development Co., 70 Pine St., New York, has been named exclusive sales representative for Kennametal Mining Tools in France, its protectorates and mandates, Saar, Spain, and Italy.

GLYNN WILLIAMS has succeeded E. W. Ostrom as Ch'f Eng'r of Axelson Manufacturing Co., Los Angeles. Williams has been associated with the company since 1934, recently as divisional head of aircraft engineering. Ostrom, who has made many outstanding contributions in the field of petroleum engineering, resigned after many years of service with the company.

J. C. (TOMMY) THOMPSON has been advanced to chief process engineer and A. F. (TED) KNOSE to master mechanic, at the Hagerstown, Ind., plant of The Perfect Circle Corp'n.

R. M. LINDGREN, formerly chief engineer of Lincoln Park Industries, and PAUL E. DIMLING, formerly with Firth-Sterling Steel Co., will represent Metal Carbides Corp'n, Youngstown, Ohio, in the Michigan area. Their offices will be at 6432 Cass Ave., Detroit 2.

DON LOEBER, formerly with the Eclipse Pioneer Div'n of Bendix Aviation Corp'n, will represent Cosa Corporation as sales engineer in the New Jersey and metropolitan New York district.

CARL J. LINXWEILER, recently named Sales Manager of the Threadwell Tap & Die Co., Greenfield, Mass., has had a broad background of experience in engineering and management and was formerly sales manager of the Dayton, Ohio, machine tool division of the Sheffield Corp'n, of which Treadwell Tap & Die Co. is a wholly owned subsidiary.

STUART E. SINCLAIR has been named Chief Metallurgist by The Greenfield Tap and Die Corp'n, Greenfield, Mass., with offices at the corporation's metallurgical laboratory in Greenfield, he will supervise metallurgical control and research in all "Greenfield" plants, including Geometric Tool Co., where he was metallurgist since 1936.

F. C. DANNEMAN, president of Acme-Danneman Co., 203-205 Lafayette St. New York, will be exclusive national distributor for Esco and Mijit drill jigs, adapter plates and component parts, made by ESCO Engineering Corp'n, Cleveland, Ohio.

The new purchasing agent at Danly Machine Specialties, Inc., 2100 So. 52nd Ave., Chicago 50, is PAUL R. FIELDS, formerly in executive positions with the F. L. Jacobs Company of Detroit.

The election of JOHN L. PROHASKA, general sales manager, to the Vice-Presidency of The Cleveland Automatic Machine Co., Cincinnati, Ohio, was announced by Harold R. LeBlond, President. Mr. Prohaska will continue as General Sales Manager. Other officers elected include Vice-President Nicholas Peay, former assistant to the president, and Richard E. LeBlond, president of The R. K. LeBlond Machine Tool Co., Secretary, Frank Stenger, and Treasurer E. G. Schultz. These officials with the addition of R. K. LeBlond constitute the Board of Directors.

ALBERT GOLDMAN, ASTE member, vice-president and gen'l mgr. of Atlantic Manufacturing Co., Philadelphia, Pa., has been elected President of the Philadelphia Tool and Die Manufacturers Association.

ROY C. McKENNA, president and chairman of the board of Vanadium-Alloys Steel Co., Latrobe, Pa., has been elected President of the Pennsylvania State Chamber of Commerce.

DAVID M. HALLIER, sales manager, has been promoted to Vice-President of the National Tool Co., Cleveland, Ohio.

The newly organized WHITON MA-CHINE CO., 190 Howard St.. New London, Conn., has acquired the business and properties of the D. E. Whiton Machine Co., manufacturers of steam turbine engines, automatic gear cutting machines, centering machines, and lathe chucks. Lucius E. Whiton, son of the founder of the business in 1857, is Chairman of the Board; Geo. A. Highberg, for the past 10 years Vice-President and Factory Mgr. of Cushman Chuck Co., is President: and Thomas G. Hart, formetly Gen'l Sales Mgr. of Terry Steam Turbine Co. holds the same position with the new Whiton organization.

CARL B. POLLOCK, manager of the Brackenridge, Pa., plant of the Allegheny-Ludlum Steel Corp'n, Pittsburgh, Pa., has been appointed Production Manager of the company. The vacancy at the Breckenridge plant will be filled by GEORGE W. EVANS, assistant plant manager since 1944.

Ground has been broken at Worcester, Mass., for the new five-acre vitrified grinding wheel plant of the NORTON COMPANY. This plant is expected to be in operation by July, 1948. The complete expansion program of the Norton Company includes a new refractories building and additions to the administration building and the power plant.

To fill the vacancy caused by the death of F. P. Thedieck, VAL LEE has been appointed President of The Sidney Machine Tool Co., Sidney, Ohio. He will also continue as Treasurer of the company.

FRANK W. SUTTON has resumed his private practice as engineering consultant at 2984 Wilshire Blvd., Los Angeles, with affiliated offices in San Francisco, Chicago, and New York. During World War II, he worked in a similar capacity with various war contractors and engineering branches of the Army Ordnance.

Recent appointments by KENNA-METAL, INC., Latrobe, Pa., manufacturer of cemented carbide tools, include Gilbert A. Bunn, manager of the Middle-Atlantic District, with offices in Philadelphia, Pa.; Charles Herbert Bodner, tool engineer and representative in Los Angeles area; John H. England area; and Richard H. Oberholtzer, in Detroit District. Lundwall & Co., V. Hamngatan 5, Goteborg, will be the distributing representative in Sweden. The Laurent Industrial De-velopment Co., 70 Pine St., New York, has been named exclusive sales representative for Kennametal Mining Tools in France, its protectorates and mandates, Saar, Spain, and Italy.

R. M. DINGREN, formerly chief engineer of Lincoln Park Industries, and PAUL E. DIMLING, formerly with Firth-Sterling Steel Co., will represent Metal Carbides Corp'n, Youngstown, Ohio, in the Michigan area. Their offices will be at 6432 Cass Ave., Detroit 2.



## Carbide Tool Life Increased 3 to 10 times

- More pieces between grinds
   Less down time
  - More grinds per tool
- Lower tool cost

## TYPICAL CASE

Part: Locomotive Driving Wheel (Cast Steel)

Machine: Betts 100" Vertical Lathe

Operation: Turning outside diameter

Digmeter: 53%"

Width: 51/2" Depth of cut: 1/8" to 3/8"

Feed: .055" Speed: 175 ft.

Pieces per Grind: 14 wheels\*

Previous carbide production: 1 to 2

wheels

\*Castings are exceptionally rough and irregular resulting in interrupted cut at the start.

THAT headline sounds fantastic—but it's a fact! Phenomenal reports from prominent users of Improved TECO Cemented Carbide continue to show increases of 3 to 10 times more pieces per tool than carbides formerly used. The case history shown herewith is but one of many similar reports.

Why not make your own run? Simply do this. Run a few tools tipped with Improved TECO, on any carbide job. Run as usual. Keep a check on pieces per grind-grinds per tool-total tool life-tool cost. Then notice its remarkable performance at higher speeds and feeds.

Slash your machining costs with Improved TECO. Outline your machining problem, for recommendation. Our tool engineers are glad to discuss your needs. Ask for latest catalog and price list.

TUNGSTEN ELECTRIC CORP., 570 39th St., UNION CITY, N. J.

Branch Office: 403 Western Reserve Bldg., Cleveland 13, Ohio Representatives: Indianapolis, Ind., Detroit, Mich.



September, 1947

## Welded Steel Cuts Cost of Base 45%

By W. E. Benninghoff, General Manager
TOCCO Division

The Ohio Crankshaft Company, Cleveland, Ohio

BY thinking in terms of welded design for the fabrication of parts and assemblies of TOCCO Induction Heating Equipment, we have been able to benefit in two important ways.

1. Day after day, we use welded design in the development of work-handling fixtures and accessories for standard TOCCO machines and in the designing of special TOCCO machines. Each must be built to match a specific application. Welding permits us to use greater ingenuity and freedom in the design of this equipment and to manufacture quicker, at lower cost.

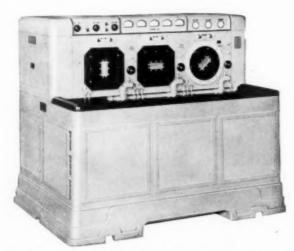


Fig. 1. Completed TOCCO Induction Heating Machine with former base.

2. In the manufacture of our standard TOCCO machines of all sizes and types, we use welded design for many parts to provide maximum rigidity and strength, lighter weight and lower cost. It also enables us to continually improve these parts because we are not restricted by patterns. The cabinet frame of the 150 KW TOCCO unit shown in Fig. 1 is an example of the larger welded steel parts which we have used for some time.

Recently we have also changed the base of the machine shown in Fig. 1 from cast iron to welded steel. The cast iron base weighed 3175 lbs. compared to 1180 lbs. for the welded steel base shown in Fig. 2. It was necessary to machine the top of the cast base to secure level mounting for the motor generator set. The welded base is

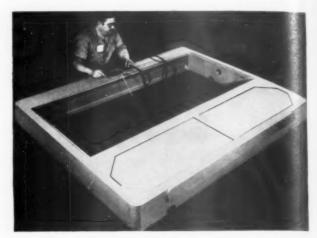


Fig. 2. The new welded steel base for 150 KW machine shown in Fig. 1.

sufficiently level as fabricated and requires no machining, thus providing further saving.

The total net cost saving with the welded steel base is 45%.

The base of this TOCCO machine supports a 150 KW high-frequency motor-generator, transformers, electrical controls and other equipment, housed in a steel cabinet. The total weight of the machine, including the base, is about 12,000 lbs. In service, it must be permanently level, rigid and have good vibration-dampening qualities.

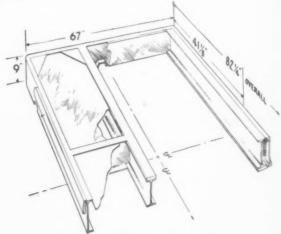


Fig. 3. Schematic drawing of fabricated base.

The construction of the welded steel base is shown in Fig. 3. Made of standard mill shapes and plate, it requires a minimum amount of welding, resulting in close control of tolerances and minimum cost. It is proving highly satisfactory in performance in every respect.

The above is published by LINCOLN ELECTRIC in the interests of Progress.

For Studies in Machine Design, write The Lincoln Electric Company, Department 415, Cleveland 1, Ohio.

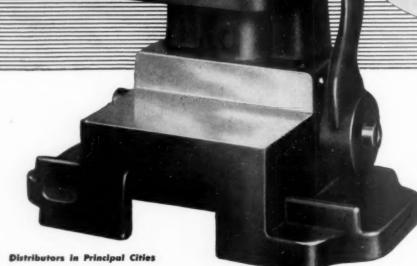
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YOU CAN BET YOUR LIFE ON THAT

THE HEALD MACHINE COMPANY, WORCESTER 6, MASS.

## NOW-you can do... SMALL PRECISION DRILL JOBS FASTER, EASIER, BETTER WITH A SIEWEK Midget 74pe SPRING JIG NO. 1500 SIEWEK



### New "Nest" Service

We now offer a "Build" service for producing the nests to hold parts in Siewek Jigs for the drilling operation. Customers not equipped to design and build suitable "nests" will find this service economical. A sketch of the proposed nest is submitted with quotation.

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100 STANDARD SIZES CARRIED IN STOCK —

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The Tool Engineer

## MICROMATIC

QUILL-TYPE AUTOMATIC HYDROHONERS

(MODELS 721-722)

OR maximum precision, single spindle Microhoning operation, these new machines may optionally provide automatic control of the following interlocked features, so that the machine follows the proper sequence of operations, and the operator is required only to load and unload work parts in the fixture:

- a) MICROSIZE automatic size control
- b) MICRODIAL automatic controlled rate of feed-out of abrasives and compensation for abrasive
- c) Automatic rotation of work in rotary indexing fixture.

The spindle-in-quill assures alignment regardless of load. The quill, hydraulic control panel, stroke control and MICRODIAL mechanisms, and rotation speed change transmission are all contained in one unit, without hydraulic or mechanical connections or linkages, thus reducing the number of parts, and the possibility of leaks.

These machines are especially adaptable to high precision work such as diesel fuel injectors and bearing races.

## pecifications

The new single spindle VERTICAL HYDROHONER For High Production

Model	721	722
Work capacity, diam., inches	1/4-1	$\frac{3}{4} - 2$
" length, inches	1/4 -6	1/4-9
Overall height x width x length, inches	104x49x68	120x30x5
Base at floor, width x length, inches	241/2 x38	26x42
Spindle reciprocation stroke, inches	0-7/16	0-7/8
Quill stroke, inches	10	12
Clearance—spindle to column, inches	91/4	91/4
Spindle nose to pads, max., inches	221/2	221/2
Hydraulic oil capacity	30 gal.	30 gal.
Coolant tank capacity	25 gal.	40 gal.



## DODGE CHICAGO PLANT

### HONE CORPORATION 8100 Schoolcraft Avenue MICROMATIC DETROIT 4, MICHIGAN

District Field Offices: 1323 S. Santa Fe, Los Angeles 21, California. Phone: Tucker 3756 616 Empire Building, 206 S. Main St., Reckford, Ill. Phone: Forest 1128 • 927A-M & M Building, P. O. Box 981 Houston 2, Texas. Phone: Fairfax 9717 • 194 Delhousie St., Brantford, Ontario, Canada. Phone: Brantford 1181- • Micromold Manufacturing Division, Boston Post Road, Guilford, Conn.



- 1. Longer Tool Life
- 2. Smoother Operation
- 3. Reduced Production Costs

Carbide tips, it has long since been proven, increase the life of cutting tools tremendously. But when they are brazed on high-speed steel bodies, they give advantages even more important than longer life.

By providing a harder base for the carbide tips, they greatly reduce "spring-back" under heavy cuts, thereby making for faster and smoother operation.

Then too, the flutes and pilots do not score or pick-up because they Rockwell C-62-63 throughout their entire length, which means that the pilot gives much longer wear.

The end result, of course, is greatly reduced production costs — a vital consideration in these days of strenuous competition.

Our engineers will be glad to work with you on your problems

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LINE REAMERS
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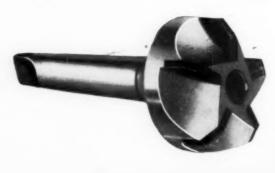
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CORE DRILLS

END MILLS

Special Tools To Your Specifications







## DETROIT REAMER & TOOL CO.

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Manufacturers of Oil-Hole Drills, Subland Drills, Special Reamers, Circularity Relieved Reamers, (High-Speed or Carbide-Tipped) -Also End Mills and Special Tools

## STAPLES TOOL COMPANY ANNOUNCES A Complete Line

OF CARBOLOY-TIPPED CUTTING TOOLS

ROLLER TURNER,
TURNING, BORING,
FACING TOOLS
MILLING CUTTERS
FORM TOOLS
CENTERS
MASONRY DRILLS



★ The name STAPLES has for many years been symbolic of undeviating high quality in the manufacture of Carboloy Cemented Carbide circular cutting tools. Now, to meet the increased demand for Staples quality, our facilities have been expanded to include Carboloy Cemented Carbide turning, boring, facing, roller turner tools—milling cutters—form tools—centers—masonry drills.

This new, complete line of standard Staples Tools is now available for immediate delivery. For all special tools, submit your requirements to Staples Design and Engineering Service. Write today for new catalog and complete information.

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A COMPLETE LINE OF SINGLE AND MULTIPLE POINT CUTTING TOOLS EXPANSION REAMERS • FORM TOOLS • CENTERS • MASONRY DRILLS • SPECIAL TOOLS

## A Few Facts You Should Know

## About acorn Dies

### SIMPLE CONSTRUCTION . EASY TO OPERATE . FACTORY TESTED

To understand the operation of the "Acorn" Die, one should see it in relation to the "Acorn" Die Holder as pictured at the right in sectional view. The feature which makes the "Acorn" Die so convenient and accurate is the manner in which the four prongs or threaded lands are compressed when the holder cap is screwed down onto the holder. As all bearing surfaces on the holder and die are ground to insure correct alignment and accuracy, even pressure is brought to bear on each of the prongs simultaneously so that they all adjust equally and concentrically. This is done quickly and automatically by tightening the cap and turning up the lock nut. No other adjustments are necessary.

A positive adjustment to size can be obtained by using the threaded plug which comes with every "Acorn" Die. This plug has actually been threaded by the die in which it is shipped and has been carefully checked for accuracy. Thus, if it is used as a setting plug, accuracy of the set up will be assured. For close to shoulder work, quick change over of jobs, accurate threads, specify "Acorn" Dies to your local Greenfield Distributor.

## HOLDERS ADAPT "Acorn" Dies FOR ANY MACHINE



### REGULAR

Regular "Acorn" Die Holder with longitudinal float which allows the die to follow its own lead independent of any lag in the machine. This holder may be used on practically all automatic screw machines and any other machines which provide for automatically reversing the die or rod at the instant when the desired length of thread has been cut.



## RELEASING

Releasing "Acorn" Die Holder, while suitable for all machines, is especially recommended for hand operated machines. The improved clutch mechanism allows the holder to be released without shock.



### ADAPTER

The "Acorn" Die Adapter permits the use of "Acorn" Dies with existing round die holders. It consists of three parts, a Cap to hold and adjust the die, a Lock-Nut to secure the adjustment and a Body. The shank fits round or spring die holders of corresponding size.



ASK YOUR "GREENFIELD"
DISTRIBUTOR FOR
12 PAGE "ACORN" DIE BOOKLET

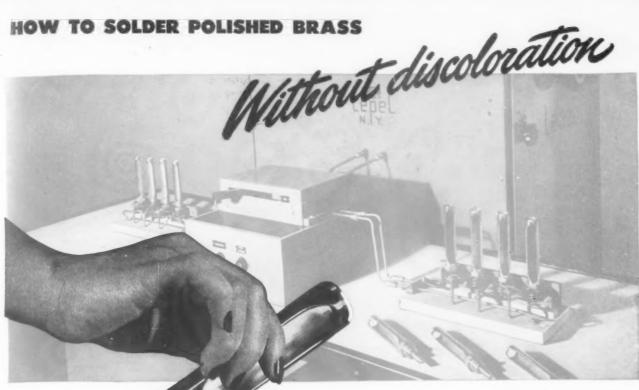






TAP and DIE CORPORATION · Greenfield · Massachusetts
and its New Haven Division The GEOMETRIC TOOL COMPANY

HOW TO SOLDER POLISHED BRASS



## 2 JOINTS IN 5 SECONDS

WITH HIGH-FREQUENCY HEATING

SOLDERING BRAZING HARDENING ANNEALING MELTING

The same Lepel Spark-gap Converter will handle any or all of these processes, usually with advantages similar to those given in this advertisement. Often this unit will prove substantially more economical than any other highfrequency generator-particularly when heating non-ferrous or non-magnetic materials. Changing from one job to another can be done in less than 5 minutes. Moeller Instrument Company, manufacturers of precision temperature-indicating devices, had this problem; how to solder two joints of this thermometer case without discoloring the highly polished brass. Solution was found in high-frequency heating, using a Lepel converter which is fully effective on non-ferrous as well as ferrous materials.

Discoloration is completely avoided by concentrating the heat quickly, exactly where needed, and in controlled amounts. Two heating operations are employed: one for the upper joint and one for the lower. With a 15-kw Lepel Converter, as used by the Moeller Company, two cases can be soldered simultaneously. Total heating time for both joints of two cases is 10 seconds - or 5 seconds per case.

A production set-up for this operation is illustrated. With a 30-kw converter, fourposition load coils can be used. With pre-formed solder rings and a change-over switch, soldering can be practically continuous - 3500 or more complete cases per day per operator. No skill is required to produce perfect joints, since timing is automatic. Working conditions are clean and cool, ideal for locating on any production line.

If you have any operation - on ferrous or non-ferrous materials - which you think might be handled by high-frequency heating, let us make a quick preliminary investigation. If promising, our engineers can run tests, on samples you supply, and report just what can be done. There is no obligation; inquiries are treated with strictest confidence.

A letter to us will bring you, as you prefer, our latest catalog or a call by a representative. Any description of part or process which you can give may enable us to furnish, immediately, specific helpful data. You can help us by mentioning this advertisement.





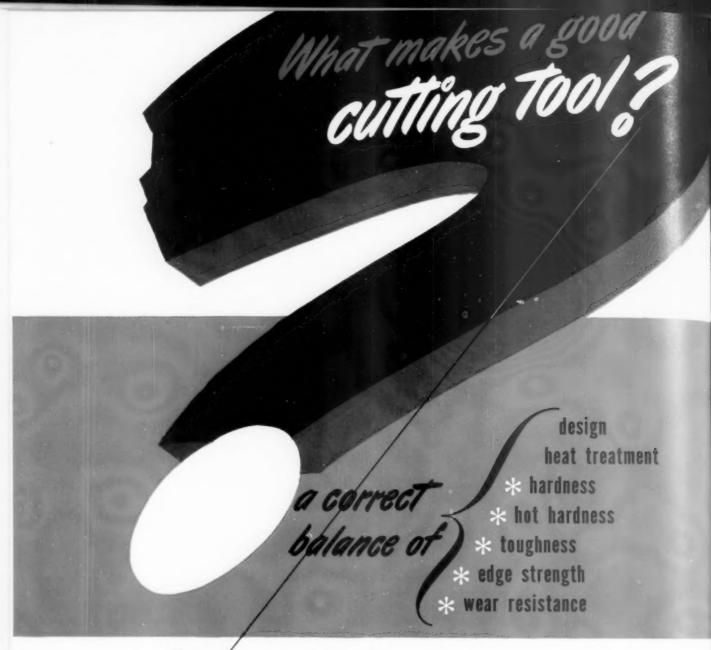




HIGH-FREQUENCY HEATING UNITS

LEPEL HIGH FREQUENCY LABORATORIES

39 WEST 60th STREET, NEW YORK 23, N. Y.





## you'll find all these properties in first-quality tool steels by Vanadium-Alloys

Proper design and heat treatment are in the province of the toolmaker...every other advantage is inherent n our Tool Steels! Here is the list of maximum properties in our leading brands—use it for ready reference:

Top Hardness-VASCO SUPREME . . . GRAY CUT COBALT . . . NEATRO

Top Hot Hardness-GRAY CUT COBALT . . . RED CUT COBALT

Top Toughness-VASCO M-2... VAN-LOM... 8-N-2... RED CUT SUPERIOR

Top Edge Strength—RED CUT SUPERIOR . . . VASCO M-2

Top Wear Resistance—VASCO SUPREME . . . NEATRO

Dur field representatives will gladly consult with you on your intended applications.



Manufacturers of FIRST QUALITY
TOOL and DIE STEELS

Vanadium-Alloys

STEEL COMPANY

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To offset rising labor and material costs, you are seeking ways to step up the amount and quality of your daily work output.

In that endeavor you should consider carefully this point-visual efficiency largely controls production efficiency. Fast, accurate, more comfortable seeing not only increases ability to do more and better work but also makes for increased satisfaction with working conditions. Provide your employees with a thoroughly modern seeing toolthe new Dazor Floating Magnifier. Two seeing aids are combined in its compact movable head: (1) magnification which steps up the size of the object under examination, and (2) shadowless, glareless fluorescent lighting, concentrated upon the work area. A touch of the hand floats this magnifier to the desired position. At whatever angle placed, it stays put without locking—held firmly by the patented Dazor Floating Arm.

Precision workers, inspectors, bench men, assemblers, draftsmen—virtually all can use this two-way sight-booster to help you boost production and hold operating costs in line.

Phone Your Dazor Distributor for complete details. For his name, if unknown to you, write Dazor Manufacturing Corp., 4481-87 Duncan Ave., St. Louis 10, Mo. In Canada address inquiries to Amalgamated Electric Corporation Limited, Toronto 6, Ontario.

## DAZOR FLOATING MAGNIFIER WITH FLUORESCENT LIGHTING



MOVES FREELY INTO ANY POSITION AND STAYS PUT-WITHOUT LOCKING

### CHOICE OF 2 BASES

### UNIVERSAL

The model pictured above is equipped with this base; it can be clamped or screwed to any surface—horizontal, sloping or vertical

## TO CONTRACT OF THE PARTY OF THE

## PEDESTAL

Also available in a portable floor-type unit (with pedestal base) for physicians, first aid rooms, schools, libraries, etc.

## "You're cordially invited-

... to drop in and say hello at the MACHINE TOOL SHOW"

ECLIPSE will display its complete line of fine end cutting tools for your analysis. The booth is 603, northeast end of building ... see you there. ECLIPSE COUNTERBORE COMPANY

CORE DRILLS

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MULTI-DIAMETER **CUTTERS** 

. . . A complete line of fine end cutting tools: HSS and carbide tipped cutters . . . Standard and special tools . . . Special holders and drives . . . Welch plug sets . . . Countersinks.

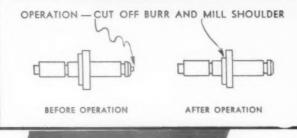


THE production run on this dial shaft was not sufficiently large to warrant automatic machines. Yet, the cost of deburring the end and milling the shoulder in two separate hand operations was too high to suit Rodney Opp, factory manager of Ranco, Inc.

Ranco's tool room went to work. Under the direction of Charles Calland, process engineer, they designed and built the small, special purpose machine shown above. Operated by two Bellows Air Motors, this inexpensive unit, nicknamed the "windmill," jumped production to better than 900 per hour—held operator fatigue to a minimum—reduced part cost by 31%.

Bellows "Controlled-Air" Powered Devices are providing a helpful answer to cost-conscious production men looking for inexpensive ways to increase output — quickly.

"Controlled-Air" Power, intelligently applied, can eliminate costly repetitive manual



operations, often permits grouping multiple operations on a single machine; makes possible short run production at a cost reasonably comparable to long runs on expensive factory-built special purpose machines.

The operation pictured above is fully described in Foto Facts File FF47-742. We will be happy to send you a copy, together with the interesting new booklet "'Controlled-Air' Power for Lower Production Costs," without cost or obligation. Address The Bellows Co., Temple Square, Akron, Ohio.

The Bellows Co.



These two modern bench-type machines supplement each other . . . are especially adapted to "internal" operations.





## The **MILWAUKEE**PROFILE GRINDER

is used for precision finishing of hardened steel parts; grinding curved surfaces and irregular contours.

## The MILWAUKEE DIE FILER

is used for fast, accurate, straight-line, sharp-corner filing, sawing and lapping in the softer metals preparatory to hardening.

## You Need Both

They are stocked and sold exclusively by Industrial Machinery and Mill Supply Distributors. Write for bulletins and name of nearest distributor.



## Wow! Genuine Johansson Sintered Tungsten Carbide GUARD BLOCKS

"A" Standard (±.000004") "B" Standard (±.000008") Protect your valuable Jo-Blocks with a pair or two of these new super-hard Johansson Guard Blocks! Simply wring them onto the ends of any Jo-Block combination and they'll fend off virtually all the impact and abrasion of any gaging job.

## Practically Wear-Proof!

Made of finest Sintered Tungsten Carbide, finished to Jo-Block brilliance and accuracy. Available in "A" and "B" standards, and in thicknesses of 0.100" and 0.050", cased in pairs or complete sets of four blocks, at very moderate cost.

PATENTED AND WARRANTED BY FORD • TO PROTECT AND ENORMOUSLY LENGTHEN THE SERVICE LIFE OF YOUR



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3614 Schaefer Road, Dearborn, Michigan



In drilling flange hole of this exhaust manifold a special base was provided on account of its height. However a Swartz L type fixture is plainly recognized.

Reduce Clamping Time of Odd Shape Parts

Rapid Clamping Can Be Applied to
Any Part

One Wrench Often Replaces Four Slow Operating Clamps

Ask for Catalog 941

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It's full of valuable information on taps and tapping praceedures —written by shop men for shop men. Drill sizes and tap fits are listed. Write today on your letterhead for a copy. In production of the popular new post-war line of Massey-Harris tractors, Besly Taps prove their accuracy and stamina in tapping tough cast iron—one of the most severe tests of tap quality and endurance.

Thousands of other leading American manufacturers also depend on Besly Taps for close-fit, low-cost work... many of them for more that 50 years. Besly Taps meet exacting specifications—particularly for clean-cut, economical threading.

If you have a tap problem—remember, a Besly engineer is ready to help you find the answer.



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## Increases Average Tool

## Life 300%-and Up!

"Flash-plating" with Racine-Lundbye Process Chrome lengthens the average life of new and resharpened perishable cutting tools 300%. Here are some outstanding examples: production records show that Lundbye Processed armor steel drills give 400% more service; turning tools give up to 500% longer wear; reamers for aluminum last nine times longer; thread cutters last 14 times longer. These are but a few scattered examples of what the amazing Racine-Lundbye Process is doing in industry. The micrometric thinness, the perfect bond and extreme hardness (tests from 400 to 1200 Brinell) prevents wear far beyond previous practice. Get the full facts. A Racine Plating Company metallurgist will consult

## No Regrinding or Lapping after Plating With "Tri-Chrome

Here's good news to users of such tools as taps, hobs, broaches, reamers, thread and ring gauges, etc. With controlled deposits of Racine "Tri-Chrome", hard-chrome finishes up to .002" thick. tool sharpness is maintained without necessity of regrinding or lapping after plating. In the restoration of badly worn or undersized tools and parts, this process applies hard chromium to any desired thickness . . . best applied a few thousandths oversize to permit the worn area to be reground to tolerance. The strong affinity of coating for base metal, in the "Tri-Chrome" Process, eliminates the danger of chipping or peeling. Let a Racine technical representative give you the full details.

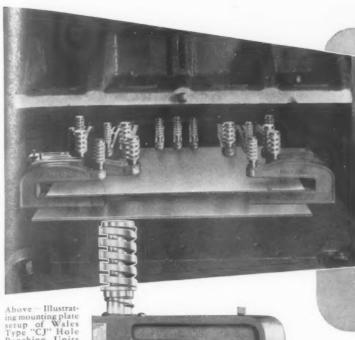
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RACINE, WISCONSIN

Specialists in Chrome Plating

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NOTHING CAN BE WHAT COME BE SIMPLER FOR HOLE PUNCHING THAN

WALES

PATENTED AND
EXCLUSIVE TEMPLATE
MOUNTING METHOD\*

Above Illustrating mounting plate setup of Wales Type "CJ" Hole Punching Units ready to punch the 14" thick work in position.

Showing a typical Wales Type "CJ" Hole Punching Unit with '4" angle nested to be punched. Note the high die which provides unobstructed slug clearance and permits close punching to leg of angles.

... one important application is in combination with

WALES Type "CJ" UNITS for punching mild steel up to

## 1/4" THICK

• Wales Patented Mounting Method requires only one template and only Wales Units have this simple setup method. The template serves a dual purpose by combining the mounting plate and the hole punching pattern.

Faster setups, almost complete elimination of press "down time", and easier storing of combined templates and mounting plates without Wales Units are NEW money-saving and time-saving advantages that cannot be overlooked in today's high cost of production.

Tooling is reduced to a simple, quick assembly operation by Wales Units. This self-contained and versatile equipment may be used and reused in an unlimited number of setups keeping the die investment in continuous productive operation.

Write for complete information, catalogs and bulletins.

\* Note: Wales-Strippit Corporation has not granted permission to anyone to use this patented mounting method except with Wales Hole Punching and Notching Equipment.

## WALES TYPE "CJ" HOLE PUNCHING UNITS USED ON T-SLOTTED PLATES IN STAMPING PRESSES AND ON BED RAILS IN PRESS BRAKES



Showing a setup Wales Type "CJ" Units in press brake for punching staggered holes.

Note the 1/4" thick

holes. Note the 1/4" thick work in position in the Units.

Showing Wales Type "CJ" Hole Punching Units mounted on a Tslotted plate in a stamping press with work ready to be punched.



## WALES-STRIPPIT CORPORATION

GEORGE F. WALES, President

393 PAYNE AVENUE, NORTH TONAWANDA, N. Y.

WALES-STRIPPIT OF CANADA LTD., HAMILTON, ONTARIO

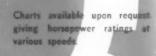
Specialists in Punching and Notching Equipment



## KNOWN BY YEARS OF SERVICE

Infinite speed attachment or clutch control optional for most models.

DRIVE-ALL offers transmissions and mounting equipment especially designed for vertical shaft operation as well as for berisontal mounting. Sizes range from ½-HP TO 30-HP. 34 Different Drive-All Models to meet your specific require-



3- TO-HP

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1/2- to 2-HP

## DRIVE-ALL POWER TRANSMISSION EQUIPMENT

## DRIVE-ALL MANUFACTURING COMPANY

Div. of Haskell Machinery Company-Organized 1925

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Spring governor provides automatic volume control, supplying only the needed flow of oil at a pre-determined pressure.

Tilted vanes cannot seize or gouge the pressure chamber ring. Constant efficiency is maintained.

> Heavy duty pump shaft is mounted in antifriction bearings for long life and power saving operation.









is automatically traversed between side plates to vary oil delivery.

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ACINE pumps will simplify your circuits. By-pass and relief valves with the accompanying extra piping are eliminated. Since RACINE pumps bypass no oil, heating is reduced. Horsepower is saved. Quieter operation results. These features reduce installation cost and operating expense.

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No matter how small the job... no matter how large... putting Carboloy Dies to work in your press-room means,

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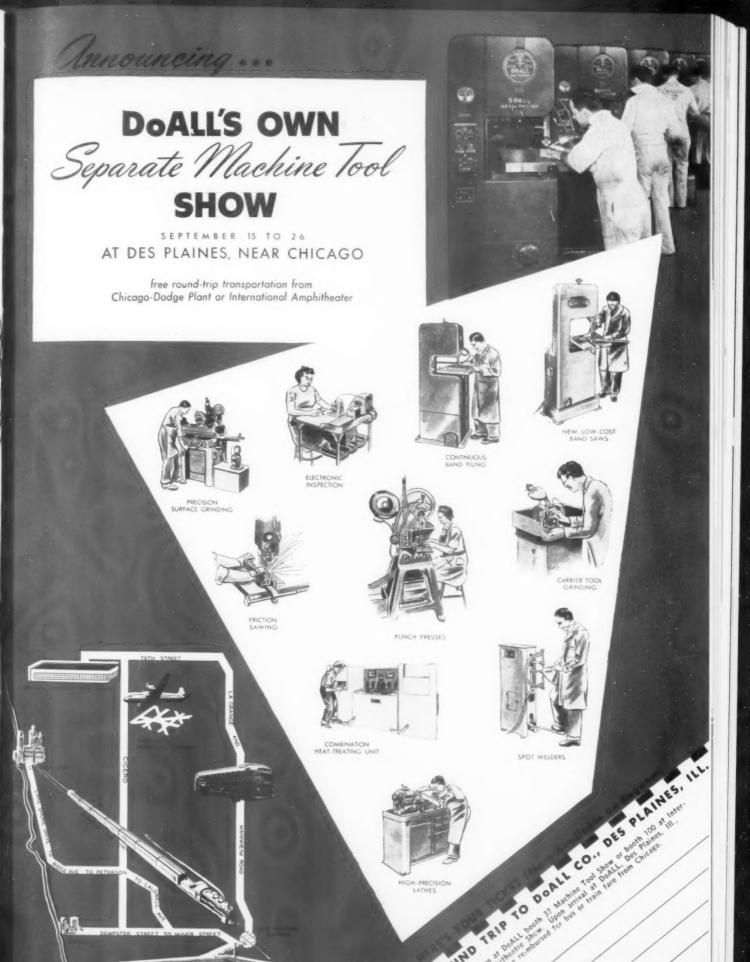
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MULTIPLE SPINDLE DRILL HEAD

Head can be furnished with 2 to 10 spindles, saving 2 to 10 Operations. Standard Spindle No. 1 M. T. Spindle Capacity 1/2 drill in Cast Iron Standard. Fits any machine.



3	Spindle	Head	\$177.	7	Spindle	Head	\$285.
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Also manufacturers of all types of fixed center heads. **SINCE 1915** 

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Write for bulletins describ-ing full line of Langelier Automatic Units and Ma-chines for high speed, accu-rate, automatic operation. Our Engineering Depart-ment will gladly make recommendations for your requirements.

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> AUTOMATIC UNITS for MULTIPLE DRILLING TAPPING ETC.

Speed and efficiency are to multi-operation production by LANGELIER Automatic Units arranged in various combinations. Typical is the Special Machine at left, which handles drilling, grooving, tapping and counter-boring operations by means of five Langelier Drilling Units and one Tapping Unit. (Also available: milling, reaming, spotting, chamfering, etc.) Multiple Spindle attachable Langelier heads may be mounted on feed sleeves of each Unit for combinations of these operations.

E tire machine, as illustrated, is electrically interlocked for fully automatic operation and central control. Work manually loaded and clamped in fixtures on 4-station dial. Note fixtures mounted at 10° angle to permit drilling into rear of work.

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Drilling and Swaging Specialists for Over 50 Years . . . Incorporated 1887

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## PRODUCE MORE HOLES PER GRIND



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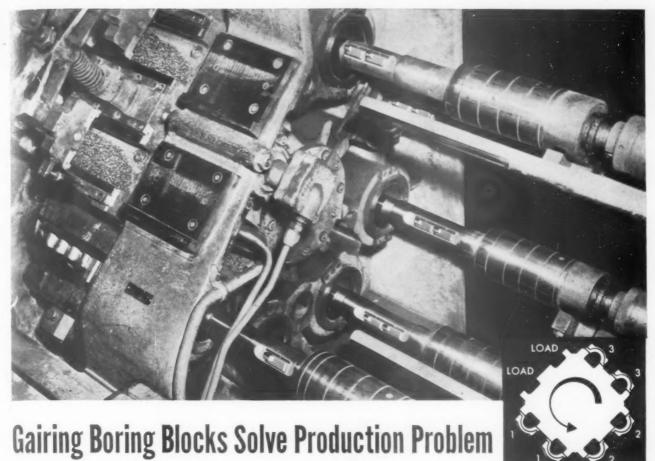
The CIFUEL AND TWIST DRILL COMPANY

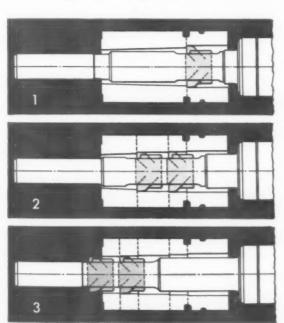
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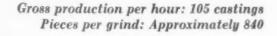
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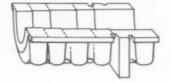


INTERNATIONAL AMPHITHEATRE 10:00 A.M. - 9:30 P.M. (Except Sunday,











At a large automobile plant in Flint, Michigan these Gairing block type tools win enthusiastic approval. The problem: Rough boring a set of five cast iron crankshaft bearing caps of varying sizes and diameters.

The solution: The five caps were cast in one piece. The largest diameter to be bored was placed on one end, with each successive piece requiring the next smaller bore. In a specially built Natco index chucking machine, two castings are clamped down at a time (upper left of photo, loading stations). Indexed downward 90° to the first working station, the largest diameter is bored in each casting. At the next station, the two next smaller diameters are bored, and two again at the third station, so that at the end of the operation the castings appear as in the lower diagram, ready to be multiple drilled for bolt holes and cut apart into five bearing caps.

The ten Gairing standard cutter blocks used on these boring bars are quickly inserted and positively locked in rigid alignment in just a few minutes. Machine down-time is negligible.

Ask for our eight page booklet which fully illustrates how Gairing quick-change cutter blocks give greater rigidity to boring bars.

THE GAIRING TOOL COMPANY, DETROIT 32, MICHIGAN





# Shape-Form-Shear

#### ... ON A "CINCINNATI"

Today Cincinnati Shapers are more efficient than ever before with heavier cutting capacities and speeds up to 200 strokes a minute on the 16"; and with a degree of accuracy that has never been excelled. Their power rapid traverse; multiple cam feeds; direct reading dials; and automatic oiling sell discriminating buyers. Coupled with these mechanical features are convenient controls; simplified adjustments; and means for quick and easy set-up, all of which please the operator.

Cincinnati Shapers are built in regular or universal type from 16" to 36". Ask for Cat, N-3.

See these machines under power at the Show



Cincinnati Press Brakes, the brakes of many uses, are today's machines for bending, forming, flanging, or multiple punching sheet metal. For easy fabrication, formed parts must fit; therefore accuracy is a fundamental advantage of these Brakes. Full-rated capacities; all-steel construction; built to withstand overload; deep bed and ram to avoid deflection are a few of the high points. These Brakes are built as accurately as a machine tool, and have unusual mechanical refinements.

Sizes to cover practically any requirement. Ask for Cat. B-2

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Cincinnati All-Steel Shears offer a new degree of accuracy in shearing sheet metal. They cut to tolerances that take a micrometer to measure; and shear with this accuracy at high speed. They shear a wide variety of material in both ferrous and non-ferrous metals. Hydraulic holddowns automatically clamp any gauge of metal with the same firm pressure; fine adjustments for the four-edge knives give more efficient use of the keen edge and longer life. Rapid, accurate gauging speeds up handling of the job.

Standard capacities of Shears range from 10 gauge to 11/4 inches. Ask for Cat. S-4.

See these machines under power at the Show



THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A. SHAPERS · SHEARS · BRAKES

Machine Tool Show

Booth No. 417



Bryant Thread Gages completely eliminate tedious, time-consuming threading of gages into or onto parts being inspected.

When inspecting internal parts, the segments are retracted by the control lever — the work is dropped over the segments — the control lever is released, and immediately engagement is made on all the threads.

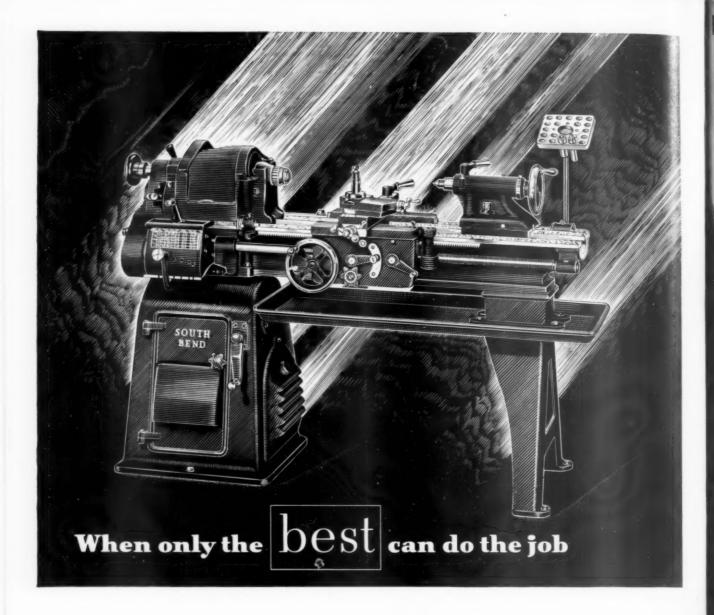
A partial turn of the work indicates overall accuracy within required tolerances, or accumulated inaccuracies of lead, taper, pitch diameter, thread form or the presence of burrs. External threads are inspected in the same manner, except that the segments are expanded to allow the part to be dropped inside.

The unique design of Bryant Thread Gages practically eliminates wear on the segments — it allows inexperienced help to inspect threaded parts four to five times faster than experienced inspectors using conventional gages — it eliminates the "feel" required in plug and ring gaging — it offers a method for complete, overall inspection of master plug and ring gages, and a method of transferring their accuracy to production threaded parts.

Write today for illustrated folder No. G2 which gives complete details.

BUILT IN 3 STANDARD MODELS

SPRINGFIELD, VERMONT, U. S. A.



There are critical jobs in every toolroom that exact the best in skill and accuracy—that test the mettle of 'men and machines. It is then, when only the best can do the job, that the value of South Bend Precision Lathes is appreciated to its fullest extent.

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Versatility for All Types of Work . . . . .

South Bend Precision Toolroom Lathes are made with 9", 10", 13" (see top illustration), 14½", and 16" swings. South Bend Distributors in all principal cities—for name and address see "Machine Tools" in classified section of phone book.



Prompt Delivery from distributor's stock or from the factory, Prices-South Bend Toolroom Lathes from \$439.00, f.o.b. factory, Time Payments — 25% down, bal. 12 mo. Low finance charge.

of these lathes—their accuracy for close-tolerance machining—their simplified controls for easy operation.

Ask your own toolmakers. They know precision tools and can also tell you in what other ways South Bend Precision Toolroom Lathes can contribute to better craftsmanship on your tools, dies, and fixtures.

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WINTER Precision Ground Thread Taps give you two important advantages: improved quality of product and simplified assembly. These taps also make possible the fast and efficient operation required by today's mass production. WINTER Precision Ground Thread Taps are made in the following styles: high speed standard and three-fluted hand taps, machine screw taps, and chip driver taps, and are made to order for special applications. Specify WINTER Taps for every thread-cutting job.



Craftsmanship of the highest order always has been employed in the manufacture of WINTER Taps.



YOUR LOCAL DISTRIBUTOR carries a complete stock of WINTER Taps on his shelves—as close to your tapping problems as the telephone on your desk.

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NATIONAL produces ground hobs for work that is to be finished to close tolerances; unground hobs for maximum economy in work that is to be ground to finish dimensions after hobbing. Shown above is a NATIONAL Spline Shaft Hob without clearance lugs for generating a radius between the side and root diameter of spline. Two other styles of NATIONAL Spline Shaft Hobs are hobs with clearance lugs and hobs with round bottoms—part of NATIONAL'S complete line of Rotary Metal Cutting Tools.



WHERE offer complete stocks of NATIONAL Cutting Tools. Call them for cutting tools or any other staple industrial product.



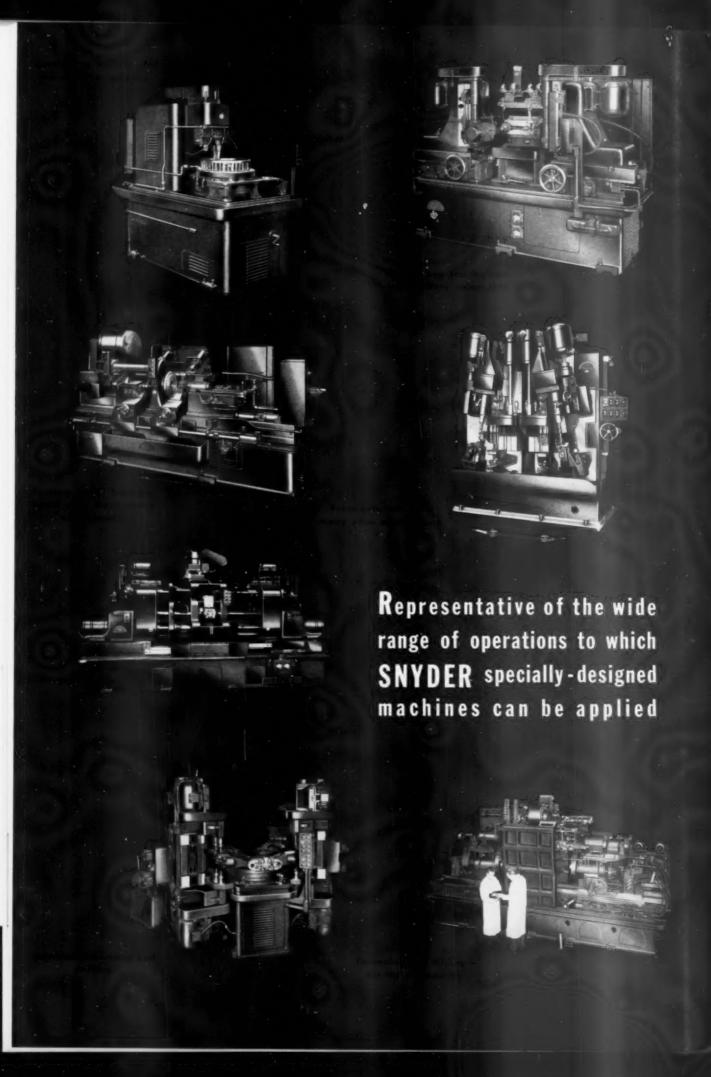
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# SNYDER designs and builds special-purpose machines for every type of metal-cutting operation

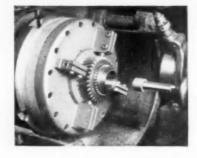
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• THREAD RING GAGE

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★ Progress is on parade at the 1947 Machine Tool Show! And Woodworth marches forward, too, with its outstanding contributions to the machine tool world:

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- DIAPHRAGM CHUCKS—featuring maximum accuracy and minimum maintenance.

Why not send us an inquiry if you have a gage, chuck or jig problem in your plant? You'll find Woodworth products engineered to your needs.

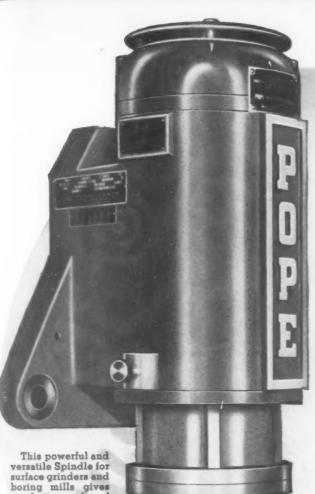
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The new 1948 Woodworth Gage Catalog just off the presses. Requests for copies must be written on company letterheads.

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# These Two POPE MOTORIZED GRINDER SPINDLES Lead The League

POPE builds hundreds of different sizes and types of Precision Spindles but these two have proved the most popular and most widely used of them all—and we've been designing and building Spindles for 27 years.

This powerful and versatile Spindle for surface grinders and boring mills gives you better work and more of it. Sealed lubrication and totally enclosed, fan cooled 3, 5 or 10 HP motor running at 1200, 1800 or 3600 RPM. Data Sheets 16, 17, 18 and 19 mailed on request.

This streamlined 6" x 18" Surface Grinder Spindle with motor sealed in and with sealed lubrication delivers full 1 HP at the wheel, runs cool, roughs off surplus metal faster, produces finer finishes. Data Sheet 12 gives you the details.

No. 45

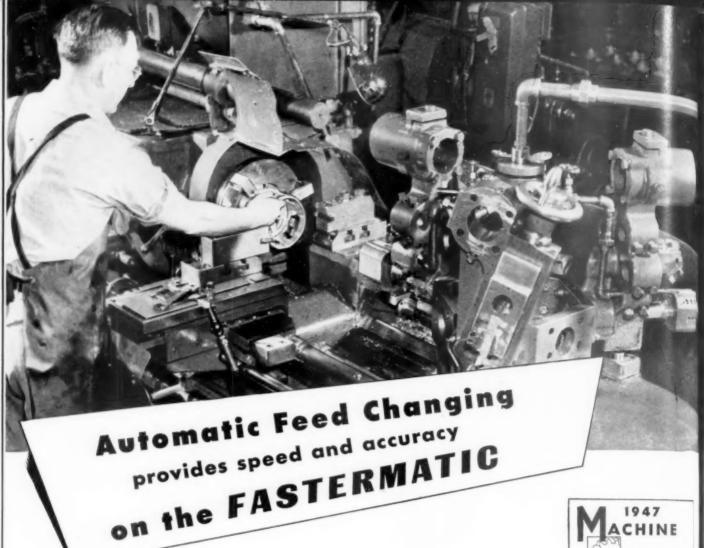
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ESTABLISHED 1920

261 RIVER STREET . HAVERHILL, MASSACHUSETTS BUILDERS OF PRECISION SPINDLES



Suppose you have a job like this—a fragile generator frame requiring the accurate machining of six different surfaces in one operation at four different feeds, each most suitable for the specific cut. Here's another case where you can use the versatile Fastermatic to real advantage.

The operator merely loads the machine—quickly and easily—using spring clamps instead of a chuck to avoid distortion. The Fastermatic does the rest, making the cuts and changing four feeds—automatically.

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Whether your problem is a delicate part like this, or a rugged forging, you'll find the Fastermatic has the ability to do the job—faster, at lower cost. Write for complete information.

See the Fastermatics, and other Gisholt equipment, in operation at the Machine Tool Show.





THE GISHOLT ROUND TABLE represents the collective esperience of specialists in the machining, surface-finishing and balancing of round and semi-round parts. Your problems are welcome here.

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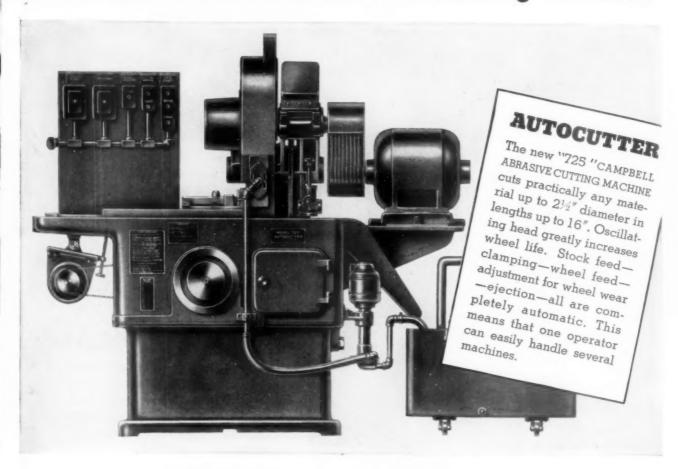


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## for Production ...

## the CAMPBELL Automatic Cutting Machine





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### CAMPBELL MAKES A FULL LINE OF ABRASIVE CUTTERS. IF YOU HAVE A CUTTING PROBLEM:

Write and tell us (1) the range of sizes,

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ALSO MAKERS OF A COMPLETE LINE OF NIBBLING MACHINES

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Be sure to visit Booth No. 271

AT THE MACHINE TOOL SHOW

Where Cushman Power Chucks will be in actual operation as well as a complete showing of wrench operated chucks and a demonstration of the Power Wrench.



Cutting knives of Bethlehem Special High Speed on hydraulic stripping machine used for smoothing welds on oil drums.

## PLANING 50,000 WELDS WITH ONE SET OF KNIVES

With a single stroke this hydraulic stripping machine removes the weld-ridges from both the inside and outside of resistance-welded oil drums. This efficient planing job is done by three pairs of knives mounted in tandem. The first pair chips off the hard oxidized surface of the weld, the second makes a hogging cut, and the third pair makes the finishing cut. One quick operation leaves the weld smooth, and flush with the adjacent surface.

Rheem Manufacturing Company, South Gate, Calif., finishes 50,000 drums in 25 days with one set of stripping knives. These knives, made of Bethlehem Special High Speed, require sharpening only once a day. Formerly Rheem found it necessary to use from three to six sets of knives during a single day's production of 2000 drums.

Bethlehem Special High Speed is the popular 18-4-1 analysis with excellent red-hardness and high resistance to abrasion and shock. It's a real money-saver for the usual types of rough - cutting machine tools, a wide variety of special cutting tools and special dies for both hot and cold work.

What's your cutting job? The nearest distributor or Bethlehem district office can give you full facts on Bethlehem Special High Speed and other quality tool steels.

BETHLEHEM STEEL COMPANY BETHLEHEM, PA.

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Bethlehem Special High Speed Tool Steel

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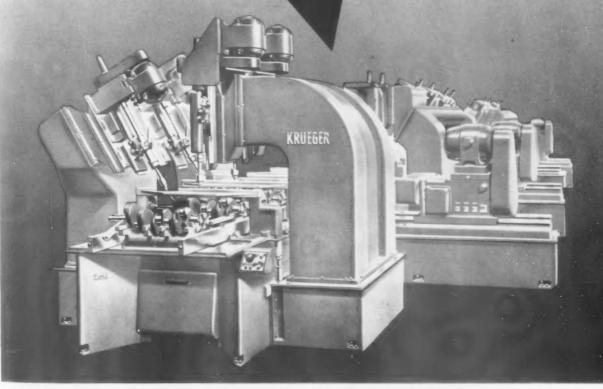
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Transfer Type Machine for drilling all oil holes of cranksheft

in one handling.

The machine below has

28 operating stations.



H. R. KRUEGER COMPANY

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## Aarvis TORQOMATIC

The new torque-driven tapper is the most modern, efficient and productive tool of its kind on the market. Performance in your shop will confirm this fact. The Torqomatic is ultra-sensitive, will tap from soap to nickel steel with finger tip pressure. It increases number of tapped holes per hour, adds life to taps and is a new pleasure for the operator. Available in standard and built-in models.

Write for fully descriptive Catalog TMT-1. A Jarvis representative will welcome the opportunity to demonstrate the Torgomatic.

garvis Dowding TAPS

For maximum performance under tapping conditions prevailing in your shop, make your next tap order read "Jarvis-Dowding"... custom finished taps, designed to meet your demands. "Jarvis-Dowding" Taps cut more threads with less power, require minimum sharpening and provide greater dependability on the job.

Write for Bulletin JD-101 for more details.

## WW POWER TOOLS

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Rotary Files • Flexible Shaft Machines

Quick Change Collets and Chucks •

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FINISHING CAST IRON

YOU WILL SEE the Ingersoll patented Shear Clear Face Mill with carbide tipped blades milling steel on an Ingersoll Milling Machine a 91" diameter carbide tipped Shear Clear for aluminum - carbide tipped Shear Clears for high

1947 MACHINE TOOL SHOW DODGE CHICAGO PLANT SEPT. 17-26 INGERSOLL BOOTH No. 58 (Next to Registration Desk)

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For complete information on Ingersall Inserted Blade milling and boring tools write for Catalog No. 55C.

Write for Catalog No. 54C for complete description of Ingersoll Inserted Blade Cutter Grinder.

THE INGERSOLL MILLING MACHINE CO., ROCKFORD, ILLINOIS



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Machinists' Tools

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Permanent Magnet Chucks

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Other Useful Shop Equipment

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Universal
Plain (including

Manufacturing Type)
Vertical

\* GRINDING MACHINES

Universal Plain Surface Cutter

Cutte

\* SCREW MACHINES

Automatic (including Screw Threading and Cutting-Off Type) Wire Feed

NEW DEVELOPMENTS for increased efficiency in manufacturing and toolroom operations will be shown for the first time at Booth 505. Come, see new ideas for improving productivity per man and machine. Get "first-hand" answers to your questions. Other well-known, time-tested Brown & Sharpe Machines, Attachments and Small Tools will be displayed also . . . a good opportunity to examine and compare all their features. You are cordially invited. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

SHARPE



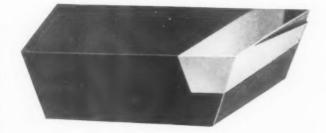


## Machining

## This HAYNES STELLITE

Tool has done
a Job on
Monel Valve Stems

Monel valve stems of various lengths and diameters are turned out faster with HAYNES STELLITE Tools.



## Monel?

A 1-in. square box tool, fabricated in the user's shop by brazing a HAYNES STELLITE 98M2 tip to a steel shank, does the combined rough- and finish-turning of valve stems made of cold-rolled Monel...at a speed of 557 r.p.m....240 surface ft. per min.... with a feed of 0.021 in. and a 3/8-in. depth of cut.

After 30 hours of use, the tool shows no sign of wear. The tool is ground to provide a 15-deg. side rake angle and a 15-deg. back rake angle; end and side relief angles of 6-deg.; a radius of 1/32 in... and no lead angle.

Another Haynes Stellite tool subsequently cuts the acme thread at 297 r.p.m. . . . 72 surface ft. per min., with a cut of 0.020 in. per pass.

If you have a machining problem, a letter or phone call to our nearest office will bring a representative to tell you more about the effective use of HAYNES STELLITE cobalt-base alloy tools...on Monel, steel, cast iron, bronze, and other materials.

You can obtain more information about Haynes Stellite 98M2 tools by writing for the booklet, "Haynes Stellite Metal-Cutting Tools," Form 5401.

#### Haynes Stellite Company

Unit of Union Carbide and Carbon Corporation

Hele

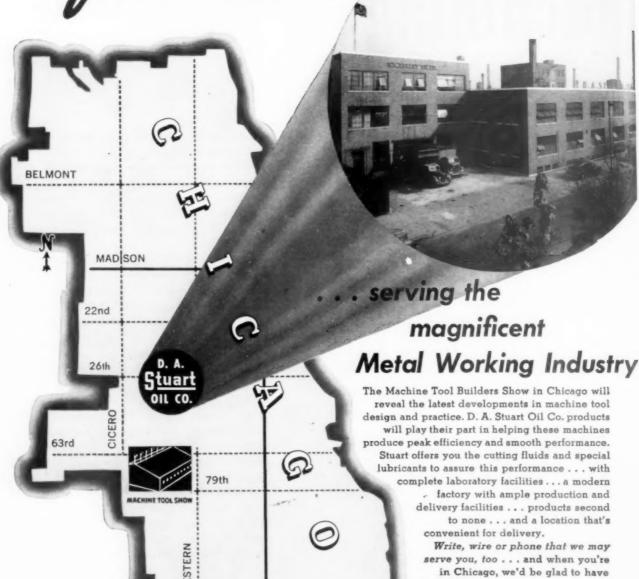
General Offices and Works, Kokomo, Indiana Chicago—Cleveland—Detroit—Houston Los Angeles—New York—San Francisco—Tulsa

The registered trade-marks "Haynes" and "Haynes Stellite" distinguish products of Haynes Stellite Company.

HAYNES

TRADE-MARK

Here are on-the-spot facilities...



We suggest that you clip this page as a reminder of the Stuart facilities available for your use during, and after the Chicago Show...

BOOTH 317L

D.A. Stuart Oil Co.

you visit us!

PHONE ROCkwell 7100

2727 SOUTH TROY STREET, CHICAGO 23, ILL.

STUANI struce goes with every barrel



STURACO DASCOLENE Thred KUT EXCELENE DASCO 34



## CARMET

CAST BODY

These military in the water of the Tybrack military in the water that is, his Market you have a world antime, providing the price of the control of the control of the price of the control of the control of the price of the control of the control of the Market of the control of the control

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CARMET outsit



CARBIDE ALLOYS DIVISION, Ferndale (Detroit) Michigan

### MACHINE TOOL SHOW · Sept. 17-26 · CHICAGO

Don't miss the

## LANDIS MACHINE CO. **EXHIBIT** · Booth 101

### MACHINE TOOL SHOW

See the Latest in Thread Cutting, Rolling and Grinding Equipment — in Actual Operation.

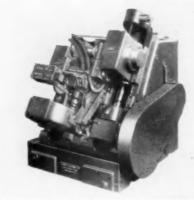




AUTOMATIC FORMING & THREADING MACHINE







The LANDIS THREAD ROLLING MACHINE



The NO. 1 CENTERLESS THREAD GRINDER

The equipment illustrated will perform various threading jobs-from high speed production to maintenance and jobbing-by cutting, grinding, and rolling methods.



PIPE THREADING & CUTTING MACHINE











The ALT COLLAPSIBLE TAP

WAYN€SBORO, PA., U.S.A.

## one Talide die will out-perform 20 steel dies

A Talide Die is one of the surest and easiest answers to long production runs and low unit cost. Depending upon the application, a Talide Die will out-perform and out-wear a steel die from 20 to 100 times.

With Talide Dies you can take much heavier drafts and increase speeds appreciably. Maintenance is reduced to a minimum, users saving as much as 50 hours polishing and redressing time on a single die.

These dies take and impart a magnificent finish, and practically eliminate all surface defects, including galling, pickup, and scratching.

The production advantages of these dies derive from the great compressive strength plus the super hardness of Talide Metal



(tungsten carbide). It's the hardest metal made.

Metal Carbides Corporation makes Talide Dies in all practical shapes and in all sizes from pinhole up to 24" inside

Send for Die and Wear Part Catalog 46-WP.

#### TALIDE METAL MEETS EVERY REQUIREMENT



BLANKING AND FORMING DIE





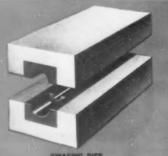
(For Deep Drawing Metal



POWDER METALLURGY DIES







#### HERE'S WHY PRODUCTION MEN USE TALIDE DIES

- 1. Longer Life
- 4. Lower Cost
- 2. More Production 5. Better Finish
- 3. Less Down-Time 6. Less Scrap

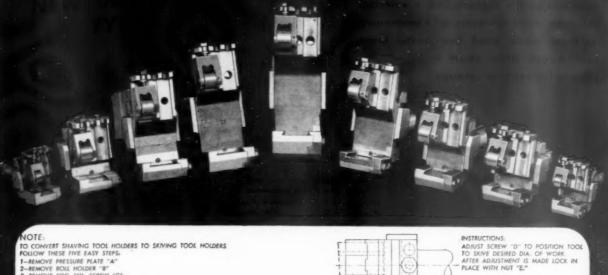


Send us prints or parts and we will submit drawings together with price and delivery information.



TOWN 5. OHIO Pioneers in Tungsten Carbide Metallurgy CUTTING TOOLS . DRAWING DIES . WEAR RESISTANT PARTS





#### NOTE

STANDARD SHAVE TOOL HOLDER

PATENT No. 2-364-320



0

SKIVING TOOL HOLDER

ST'D. "SLITTERS" SHAVING TOOL HOLDERS CONVERTED TO SKIVING TOOL HOLDERS

#### FOR RESTRICTED CENTER DISTANCES

RA4 7/8' and 1'—2nd Pos.

RA4 7/8" and 1"—3rd Pos.

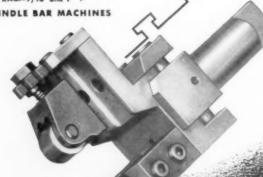
R6-9/16"

R6-9/16"

ACME-GRIDLEY MULTIPLE SPINDLE BAR MACHINES







### SCREW MACHINE TOOL COMPANY

MANUFACTURERS OF ACCESSORY TOOLS FOR ALL TYPES OF AUTOMATIC SCREW MACHINES



During the past 5 years The Monarch Machine Tool Company has built more than 35,000 lathes.

So, they know a lot about lathes . . . and lathe beds, too.

They know how to build beds that resist abrasion, scoring, wear...and maintain high accuracy to keep users' production costs low.

That's why Monarch specifies Nickel alloyed iron for all beds.

Experience shows good reason for this. For example, when their Nickel iron lathe beds, 8½ feet long, are flame-hardened to a depth of ½" to ¼", the warpage is only about 0.01". During finishing, this is ground off and final tolerance is only 0.0005".

The Nickel in the cast iron lowers the critical transformation range...thus, gives greater depth of hardness than in plain iron and minimizes distortion. Moreover, there is gradual blending of the flame-hardened layer into the softer pearlitic interior, whereas in unalloyed iron the transition zone is apt to be completely graphitized and hence extremely weak.

Consult us on the use of Nickel to meet your casting requirements. Send us details of your problems today.

Inthis SPEED-MATIC hand screw machine, Monarch uses gears, shafts and pinions of Type 8749 Nickel alloy steel, along with flame-hardened Nickel cast iron beds.

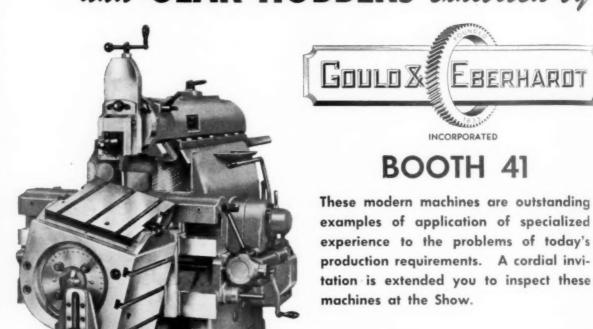


Over the years, International Nickel has accumulated a fund of useful information on the selection, fabrication, treatment and performance of engineering alloy steels, stainless steels, cast irons, brasses, bronzes and other alloys containing Nickel. This information is yours for the asking. Write for "List A" of available publications.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET, N.Y.

# See the newest developments in SHAPERS and GEAR HOBBERS exhibited by

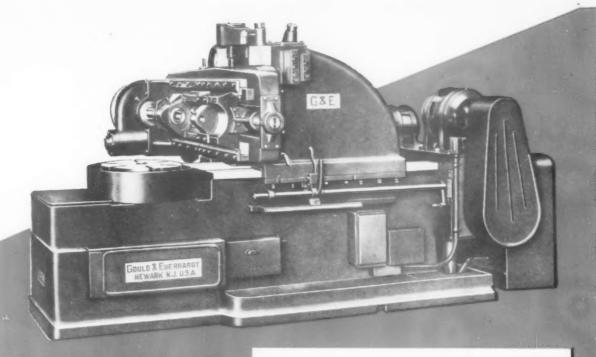
GZE



24" Industrial Universal Shaper with swiveling table and tilting top for shaping compound angles.

ALL-HELICAL
GEAR DRIVE

32" Industrial Shaper especially adapted for heavy tool and die work.



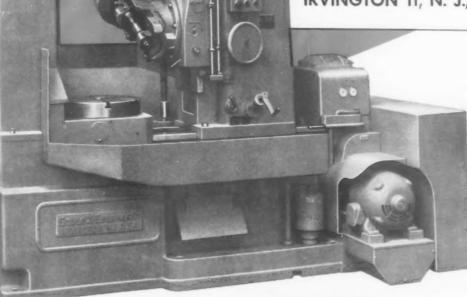
30TWG Worm Gear Hobbing Machine for the exclusive production of single-and multiple-thread worm gears.

### An Invitation

If you are unable to visit the Show, we invite you to write us for the latest literature of the machines in which you are interested. We also welcome your problem. Send it along.

GOULO X EBERHAROT

IRVINGTON 11, N. J., U. S. A.



24H Universal Gear Hobbing Machine for cutting spur and helical gears.

### GXE

· PRODUCTS ·

METAL SHAPING MACHINES

SPUR AND HELICAL GEAR HOBBING MACHINES

WORM GEAR HOBBING

CONE WORM GEAR HOBBING MACHINES

GEAR AND RACK CUTTING
MACHINES

SPECIAL MACHINERY

# OIL-FILLED BENCH STONES COST NO MORE THAN DRY STONES

but...



### .. THEY SHARPEN BETTER!

Oil filling is a built-in extra service feature of Crystolon Bench Stones — at the price of regular dry stones. And this is important, because bench stones are supposed to be used with oil. Oil makes them cut faster and cooler and produces a better cutting edge. Oil also helps them resist glazing or filling.

But oil filling is a messy job at best — and it has to be done right. The oil must penetrate the pores of the entire stone. And, unless the right kind of oil is used, the surface of the stone will gum.

Crystolon Bench Stones are made of genuine Norton silicon carbide abrasive, vitrified bonded and oil-filled at the factory for your convenience and for better sharpening. Ask your Distributor to furnish oil-filled Crystolon\* Bench Stones for extra service at no extra cost.

\* For oil-filled aluminum oxide bench stones, specify "India."

BEHR-MANNING · TROY, N. Y.

(DIVISION OF NORTON COMPANY)

NORTON ABRASIVES

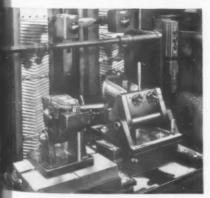
ALSO QUALITY COATED ABRASIVES SINCE 1872

THE JOHNSON SEA HORSE SHOWS HOW

ON OILGEAR SURFACE BROACHING MACHINES

Operator loading twin cylinder head in fixture on Oilgear Double Slide Vertical Surface Broaching Machine. Fixture tilts forward to broaching position.

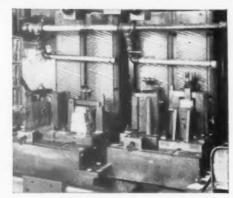
Oilgear Fluid Power



Twin cylinder head loaded on left hand fixture while two other parts in tight hand fixture are being broached.



Fixtures and parts for water pump housing and twin cylinder head. Parts are also in loaded position.



Showing wide slab broaching tools that can be applied to Oilgear single and double slide Vertical Surface Broaching Machines.



#### SAPPHIRE BEARINGS

Lowest friction coefficient. The high polish burnishes rather than wears mating parts. Can be run dry at high



speeds to 3000° F. Used in precision grinders and production equipment as well as instruments. Sleeve bearing sizes .003 to .500. Outperforms "frictionless" bearings.

REFER D-16-SAPPHIRE SHORTS

#### SAPPHIRE-AN ENGINEERING MATERIAL

- LONG WEARING
- NON-POROUS
- HIGH DIELECTRIC
- NON MAGNETIC
- CORROSION RESISTANT

Improve your product performance and salability by using Sapphire.

REFER D-8-SAPPHIRE SHORTS

#### STANDARD SHAPES

Now available for guides, wear strips, back stops, nonwearing surfaces. Assemble in your own plant by cementing, shrinking or metal bonding. Special shapes made to your specifications.



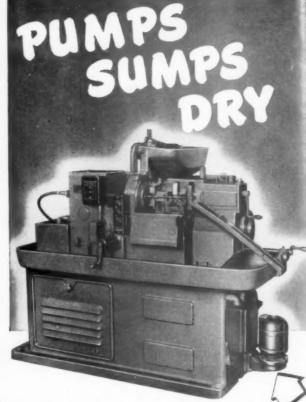
REFER D-14-SAPPHIRE SHORTS

WRITE FOR DETAILS AND ENGINEERING ASSISTANCE

PRODUCTS DIVISION

ELGIN NATIONAL WATCH COMPANY AURORA

ILLINOIS



The compact design of this Pioneer Coolant Pump, Model VBA, allows it to be installed in sumps, or pans, that are practically flush with the floor . . . designed to get the most out of a restricted or small sump base, it will empty the sump to the very bottom . . . efficiently handles coolants containing large chips or shavings . . . standard models available in capacities of 13-148 gallons per minute.



#### 400 MODEL

#### FOR LUBRICANTS AND COOLANTS

Pioneer Pumps in Seal-type, Seal-less and Rollway designs for pumping coolants, cutting fluids, abrasive liquids, lubricants and water available in every desired type and size. Please specify your needs when writing for information.

See Our Display Machine Tool Show, Space 35F

Pioneer Pump & Manufacturing Co.



# Hanna air and hydraulic Cylinders

In countless industrial applications, the productive capacity of both men and machines is limited by the capacity of human muscles. Hanna pneumatic and hydraulic muscles provide the economical—and tireless—answer to this problem. Wherever a controlled push, pull, lift, press or clamp is required on any type of equipment, Hanna cylinder power will do the job quickly, smoothly, accurately. Find out more about how these muscles can work for you by sending for the catalogs described at the right.

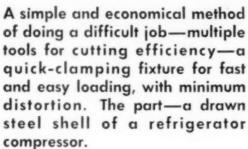




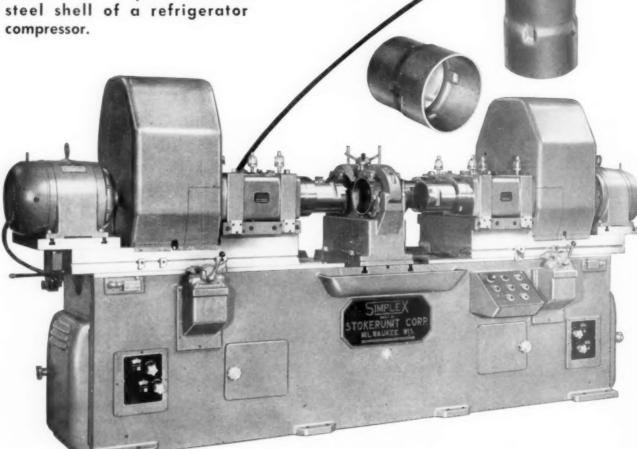
Hanna Engineering Works

HYDRAULIC AND PNEUMATIC EQUIPMENT . . . CYLINDERS . . . VALVES . . . RIVETERS

1765 Elston Avenue, Chicago 22, Illinois



## SIMPLEX



The machine shown is a SIMPLEX 3U 2-way Precision Boring Machine with four #4 boring heads, each carrying a multiple tool boring quill and an adjustable facing cutter. The parts are clamped in an equalizing fixture designed to hold the work securely with minimum distortion. Two pieces are bored and faced simultaneously, from both ends, reducing the cutting cycle to the time of the longest cut.

## Precision Boring Machines

#### STOKERUNIT CORPORATION

**SIMPLEX Machine Tools Division** 

4528 West Mitchell Street, Milwaukee 14, Wisconsin

Precision Boring Machines, Planer Type Milling Machines and Special Machine Tools

# Theirersal Floating Collet Chucks

### FOR VERTICAL OPERATION FOR HORIZONTAL OPERATION

The most sensitive floating action of any chuck on the market today is engineered into Universal Floating Collet Chucks. That means you can perform more accurate reaming, counterboring, and tapping operations in less time and with less effort.

When used in a horizontal position, the Universal Floating Collet Chuck may be brought to the center of the work in minimum time by adjusting flat springs to precisely counterbalance tool weight. Both driving and thrust loads are carried by an interlocking assembly of frictionless bearings, hence there are no auxiliary bearings to increase friction or resistance or otherwise restrict the positive floating action. A new type seal permanently prevents entrance of coolant into these chucks, so that cutting compounds may be used to permit higher speeds and heavier feeds.

For greater accuracy and efficiency in your production, it will pay you to use Universal Floating Collet Chucks. Write for complete information.

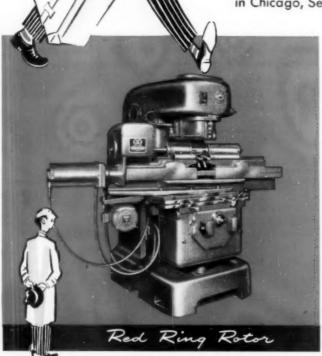


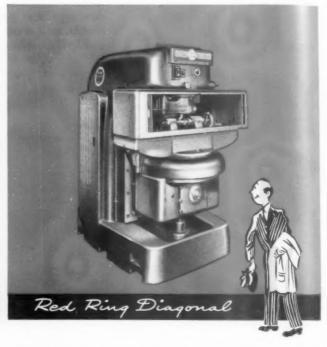
UNIVERSAL ENGINEERING COMPANY . FRANKENMUTH, MICHIGAN

# Going to the

#### **Machine Tool Show**

If you are interested in modern precision gearing, its production and inspection, you will doubtless be interested in the new Red Ring equipment to be exhibited at the Machine Tool Show in Chicago, Sept. 17 to 26.





Featured in this exhibit will be the new Diagonal Gear Shaving Machine, a high production unit which has materially extended the field of gear shaving.

Another feature will be the new Red Ring Rotor Shaving Machine which has been so successful in reducing the cost of finishing the rotor laminations of electric motors.

Included also will be the standard gear shaving machines, a gear lapping machine, gear checking and sound testing machines.

The latest in broaching practice with naloy broaches, broached parts and cutting tools will be there for your inspection.



National Broach engineers will be at BOOTH 607 to explain this equipment and answer your questions. You are cordially invited to stop by.

2709



#### NATIONAL BROACH AND MACHINE CO.

5600 ST. JEAN . DETROIT 13, MICHIGAN

SPECIALISTS ON SPUR AND HELICAL INVOLUTE GEAR PRACTICE . ORIGINATORS OF ROTARY SHAVING AND ELLIPTOID TOOTH FOR 5

# Now the school bus roars right past!

THE LITTLE RED SCHOOLHOUSE—home of a hundred pleasant memories of men who left it to build America—served well, had its day, and is going, going—or gone. Today, the community school bus, freighted with the hopes of a new time, roars right past to the big central school—advanced, scientific and better.

Going or gone with the little red schoolhouse, are countless industrial tools and methods you know. Once they were good, but now they're a drag on production. Efficient cutting tools today are tipped with carbide instead of steel.

When you install Nelco Carboloy-Tipped Cutters, and cut 100 slots in 1.4 hours instead of 3.2 hours—that's progress! That's cutting cost. That's boosting output. That's getting more pieces per manhour. That's getting the jump on "little-red-schoolhouse" competition. That's just plain common sense.

Nelco Carboloy-Tipped Cutting Tools, with their tough, all-alloy steel bodies, can be mounted on standard equipment. They give you greater precision, finer finish, less tip breakage, more production, more profit. Let a Nelco Service Engineer show you how a moderate outlay for these modern tools will pay you many times over.

NELCO CARBOLOY.TIPPED TOOLS

Steen and with Brazed

Every modern technological development is utilized in making Nelco opment is utilized in making Nelco opment is discribing the finest of all carbide-tipped tools. Sandwich brazing is one example of that. A strip of non-ferrous metal between cutting edge and tool per between cutting edge and contraction—in mits expansion and contraction—in mits expansion and contraction—in fire eases the life of every Nelco tool.

NELCO TOOL CO., INC.

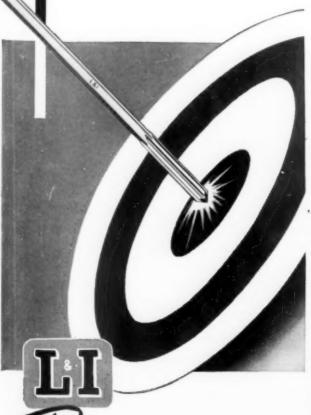
370 HAMILTON AVENUE, BROOKLYN 31, NEW YORK

# Accuracy...

... comes naturally to L & I Reamers.

It's the way they're built that does it.

First, bar stock — the finest obtainable — is thoroughly heat-treated, evenly hardened. Then L & I grinders go to work cutting keen, true-line edges. Every flute is ground — not milled — for better chip slippage. And grinding from a pre-heated bar gives you reamers with closer dimension control, sharper cutting edges, longer production life.



Reamers GROUND FROM THE SOLID

LAVALLEE and IDE, INC., CHICOPEE, MASS.

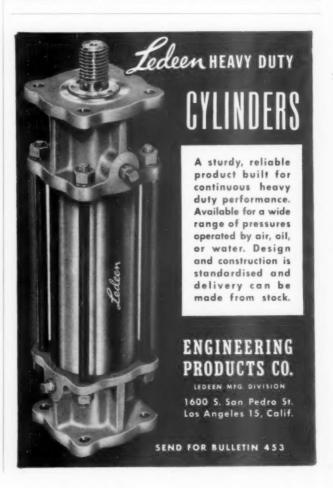


Faster precision production is possible with the exceptional table speed of Grand Rapids Hydraulic Feed Surface Grinders. Both longitudinal table travel and cross feed are automatic, hydraulic. Wheel head is powered for rapid vertical travel.

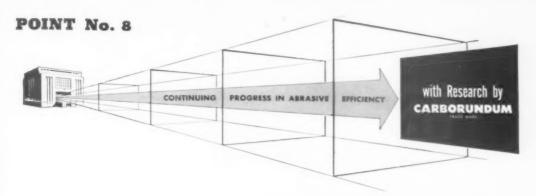
Write for Bulletin GL-101

#### GALLMEYER & LIVINGSTON COMPANY

Manufacturers of Grand Rapids Grinders
110 STRAIGHT ST., S. W., GRAND RAPIDS 4, MICH.



#### A BUYING GUIDE FOR ABRASIVES



#### Research and Development

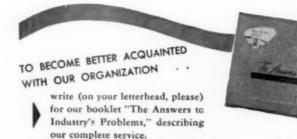
The Carborundum Company is considered a good source of supply for abrasive products because of its outstanding research accomplishments. Research at The Carborundum Company is aimed at developing uniform abrasive products that cut faster...cut cooler...grind more pieces per wheel...improve the finish and, in other ways, improve grinding efficiency.

Because abrasive research is part of the very foundation of The Carborundum Company, users can rely on abrasives by CARBORUNDUM as being in the forefront of technical improvement. It is this assurance which leads so many manufacturers, noted for production efficiency, to prefer abrasives by CARBORUNDUM. The Carborundum Company, Niagara Falls, N. Y.





dies . . . you want expert engineering advice that is absolutely impartial in its findings and recommendations. The Pioneer organization has nothing to sell but its brains and knowledge of production. When we show you how to solve your engineering and manufacturing problems, you can be sure we have no axe to grind in recommending any particular type or make of equipment. Our reports and recommendations will be based on doing your job the one best way.



Pioneer Engineering and Manufacturing Company

19645 JOHN R ST., DETROIT 3, MICHIGAN
PIONEERing Better Production Methods and Tools

VISITOUR THIBIT

AT THE

## PRODUCTION AND MACHINE TOOL SHOW

THE INTERNATIONAL AMPHITHEATRE CHICAGO, ILL. SEPT. 17-26th

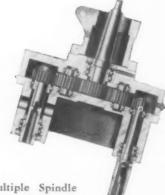
### GROB BROTHERS GRAFTON, WISCONSIN

CONTOUR METAL BAND SAWS
CONTINUOUS FILING MACHINES
FRICTION SAWS — BUTT WELDERS

COURTING

**FAST** 

COMPANY



THRIFTMASTER Multiple Spindle
Drillheads can play an important
part in speeding up your operation.
They are individually designed to meet the requirements of each specific job and to operate at full capacity
of the tools for maximum production.

The heavy duty gear assembly is fully enclosed in an oil and dust sealed housing and is lubricated by immersion. All rotating parts are ball bearing mounted. Maximum spacing is provided between spindle ball bearings to secure rigidity.

For recommendations and descriptive catalog of both fixed and adjustable type heads, write:

Engineering Department
THRIFTMASTER PRODUCTS CORPORATION
1048 N. Plum Street • Lancaster, Pa.

---THRIFTMASTER --Multiple Spindle Drillheads

## BAKER KEY TO Increased Productivity **SINCE 1867**

SEE THIS BAKER EXTRA HEAVY DUTY VERTICAL HYDRAULIC FEED MACHINE IN OPERATION AT

#### **BOOTH 639** DODGE CHICAGO PLANT SEPT. 17-26

performing fast boring operation with today's high production carbide tipped cutter head.

This model 60 HO-4 machine provides a smooth transfer of power through an extra large enveloping cone type worm and worm gear drive in operations where maximum rigidity is required. A separate display of the worm gear drive will also be exhibited at the Show, together with standardized hydraulic feed drilling units for special multi-operation

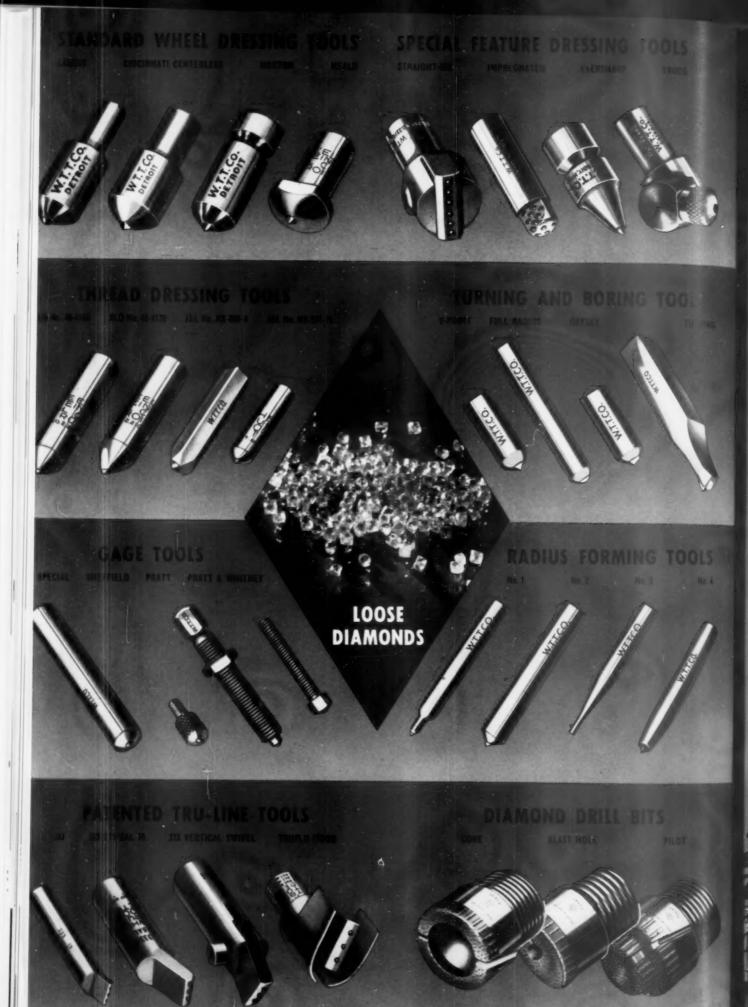
machines, new electronic feed drill, and standard Keyseating and Contour Grinding machines.

For Machinery geared to the job—See BAKER... Thoroughly experienced through 70 years of "Know-how" in the manufacture of Machine Tools.

BROTHERS, Inc. BAKER

DRILLING...TAPPING...KEYSEATING...CONTOUR GRINDING MACHINES

MACHINE TOOL SHOW BOOTH 639



We can guarantee our liamond tools because they are engineered to the job."

Harry

PRESIDENT

THIRTY-SEVEN YEARS AGO, when Wheel Trueing started in the diamond business, there were no standards of diamond tool value and guarantees were specifically avoided.

Wheel Trueing pioneered the idea of studying the job to be done, engineering the tool and the diamond to the job and guaranteeing satisfactory performance.

Consequently, for many years, Wheel Trueing customers have enjoyed the efficiency and the economy of using diamond tools scientifically matched to their work.

Our Engineering Data Sheets for supplying job information and our booklets on many types of Standard and Special diamond tools are yours for the asking. We invite your inquiries.

### WHEEL TRUEING TOOL COMPANY

3200 W. Davison Avenue • Detroit 6, Michigan

WHEEL TRUEING TOOL CO. OF CANADA, LTD.

575 Langlois Avenue • Windsor, Ont., Canada

THE ADAMANT TOOL COMPANY

Eastern Division of Wheel Trueing Tool Co.

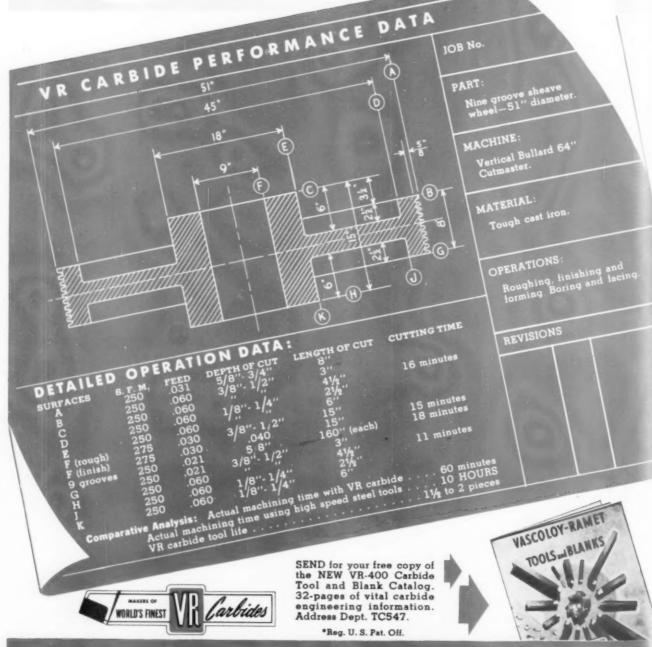
33 West Street • Bloomfield, New Jersey



Carbide

... increased production

600%



CORPORATION

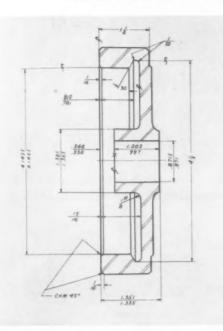
NORTH CHICAGO District Sales and Service in Principal Cities

An affiliate of The Fansteel Metallurgical Corporation and The Vanadium Alloys Steel Co

# REPORT No. 5

#### DOUBLED PERFORMANCE WITH RECESSING TOOLS!

#### TOOL ENGINEERING REPORT:



#### DETAILED DATA

Personnel making the comparative tests reacted to the extent of specifying TANTUNG exclusively. Average number of pieces per grind with TANTUNG was 70 with H.S.S. 35. Average number of pieces per shift with TANTUNG 100 with H.S.S. 38.

Send for the latest Tantung Literature today! Ask about Tantung applications on your present equipment — a sure fire method of insuring maximum production at less cost.

Job No. 1785 A

Dept. Engineering

Date: 1947

Tool:

Tantung 5/8" x 1" x 41/2"

Type:

Non-ferrous cast Alloy

Grade: G

APPLICATION: For greater speeds, feeds and more pieces per grind on all applications requiring high speed steels.

#### SETUP DATA

Part: Internal Ring Gear 41/2" dia.

Operation: Recessing Tool

Material: 1335 Steel Forging

Potter and Johnson Semi-Automatic Machine:

H. S. S.

TANTUNG

Speed: 94 R.P.M.

165 R.P.M.

Feed:

.004"

.008"

Depth of Cut:

.125"

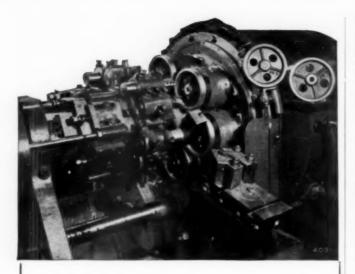
.125"

Ask your nearest Vascoloy-Ramet Field Engineer about TANTUNG Today! A V-R Field Engineer will gladly show you how TANTUNG has saved up to 600% on machining applications without any obligation on your part. REMEMBER! TANTUNG is developed to speed production, reduce tool costs and increase product quality on your present equipment.

> See V-R and Tantung in Action Booth 317J Machine Tool Show



OF FANSTEEL METALLURGICAL CORPORATION AND VANADIUM ALLOYS STEEL COMPANY



GEAR BLANKS ARE TURNED ACCURATELY AND SPEEDILY ON

"BAIRD" AUTOMATIC CHUCKING MACHINES

Here is shown a "Baird" No. 76H Chucking Machine, set up for turning, facing and boring gear Blanks made of a Special Cast Iron having a Rockwell hardness-85-90 B Scale.

The O.D. is finished turned to 6.800 plus or minus .001 and both faces are finished to 1.000 width, plus or minus .001.

The Hole is finished bored and reamed .750 diameter to plug gage and is concentric with the O.D. turning within .001 total indicator reading.

The work is held in Standard "Baird" Three Jaw Contracting Chucks, using stud type jaws for gripping. (The Spindle Turret is shown partially indexed to better illustrate the method of chucking.)

This gear is completely turned as shown to the required accuracy at the rate of 55 pieces per hour.

Selection of a spindle speed for each position, which is a special Baird Feature, permits high Spindle speeds in the finishing positions where carbide tools are used to produce the fine accurate surfaces required.

When you have Turning Operations that should be done profitably

"ASK BAIRD ABOUT IT."

THE BAIRD MACHINE COMPANY STRATFORD, CONN.



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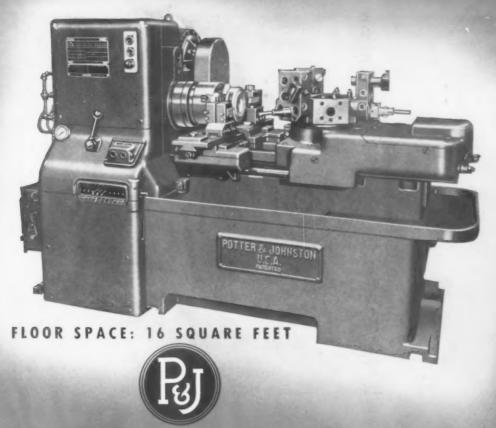
Making hardness testing equipment is our full-time job -has been for 27 years. Wilson instruments meet a wide range of requirements and every one has the dependable, enduring accuracy that has made the "ROCKWELL" scale the universally-accepted standard.

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MECHANICAL INSTRUMENT CO., INC. AN ASSOCIATE COMPANY OF AMERICAN CHAIN & CABLE COMPANY, INC.

230-H PARK AVENUE, NEW YORK 17, N. Y.





# Built into this **3U** Automatic Turret Lathe is the power & high speed demanded by carbide tooling

The latest addition to the P. & J. line of automatics for profitable production weighs only 5,200 lbs., boxed for shipment, yet it has the power, high speed, strength and rigidity required for carbide tooling. Its relatively small size and streamline design makes cleaning a simple task—and this is important in" plant housekeeping". As the machine has a constant speed drive, the motor application is very simple. The motor is mounted on a base at the rear of the headstock and a silent chain connection is employed. There are 48 changes of speed between 36-711 RPM and 73-1445 RPM. These speeds are arranged in six sets of four automatic changes. Multiple disc clutches are used for the speed changes. Strength is imparted to the machine by its sturdy construction. The ways are solid blocks of steel tongued to the base, clamped into position and ground in place. This results in permanency of alignment, treedom from scoring, and long life.

#### P. & J. AUTOMATICS

will be Demonstrated in Action
Booth 43

MACHINE TOOL SHOW
CHICAGO - SEPT. 17-26

#### GENERAL DIMENSIONS

Swing over cross slide
Travel of cross slide-each way
Number of turret faces
Diameter of hole in turret
Depth of holes in turret
Distance from center of turret hole to top of turret
slide
Total turret slide travel
Turret Feed
Spindle Adjustment3"
Cross slide adjustment None
Diameter of hole through spindle
Horsepower required to drive
Net Weight
Gross weight, boxed for sea shipment 5,600
Dimensions of Case
Cubic Contents

OTTER & JOHNSTON MACHINE COMPANY

PAWTUCKET, RHODE ISLAND

# Sidney PRESENTS AN LINE OF ENGINE



SIDNEY OHIO

Builders of Precision Machinery

# ADVANCED Mew-IN DESIGN... LATHES Mew-IN CONVENIENCE... Mew-IN ACCOMPLISHMENT...

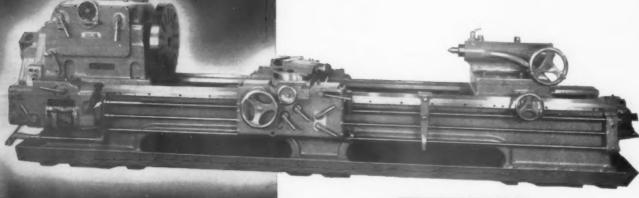
See them at Booth No.16 • In this line of new Engine Lathes Sidney has anticipated both the power needs to drive carbide tools and high speeds and feeds required to meet new production demands.

Running at speeds which would have sounded fantastic only a few months ago—you'll be amazed at the speed of these machines—at the ease of control—and at the precision of the work turned by them.

Another distinguishing feature of these lathes is the continuous tooth herringbone geared head developed by Sidney. This unit is largely responsible for the smooth flow of power to the spindle-minimum of back-lash-and freedom from chatter.

Look them over—see them in operation and determine for yourself the many advantages Sidney Lathes offer in greater production—ability to meet close tolerances—and lower cost per piece.

Full descriptive bulletins will be available at the show. If you are unable to attend the show write us for details or ask for a representative to call.



since 1904

SIDNEY

# DOWN go turning costs\* at MONARCH Booth 208

SEE THESE NEW PROFIT-MAKERS TAKE THE INFLATION OUT OF HIGH LABOR RATES

1-10" x 20" Model EE Sensitive Precision Toolmaker's Lathejust what the name implies and fast, too.

2—10" x 20" Model EE Sensitive Precision Toolmaker's Lathe, Metric Design—a complete range of built-in metric feeds and speeds.

3—10" High-speed Manufacturing Lathe—turning, facing and boring small work at speeds up to 5000 rpm.

4—10" High-speed Manufacturing Lathe—more high-speed production, including drilling at 18,000 rpm.

5—The Speedi-Matic—electronically controlled; the world's fastest hand screw machine.

6-10" High-speed Manufacturing Lathe with "AIR-TRACER"
—turning an unusual irregular contour at super high speed.

7—12" Mold-Maker's Toolroom Lathe—an exclusive method for rapidly and accurately cutting constantly increasing or decreasing leads.

8-12" x 30" Model C Toolmaker's Lathe—form cutter relieving.

 $9{-}12\,''$  x  $30\,''$  Model C Engine Lathe—simultaneous turning of three angular faces.

10—13" Sensitive Precision Toolmaker's Lathe—electronically controlled; a completely new conception of toolmaker's lathe design.

 $11-14\,''$ x  $30\,''$  Model C Engine Lathe—extra versatile; streamlined in both appearance and operation.

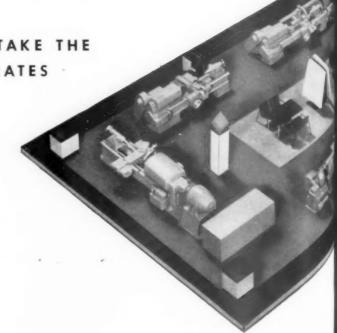
 $12{-}14{''}\ x\ 54{''}\ Model\ C\ Toolmaker's\ Lathe—for\ steep\ angles\ and\ short\ or\ long\ tapers.$ 

 $13-16\,''$  x  $54\,''$  Model C Toolmaker's Lathe with Keller controls—irregular contour facing of both increasing and decreasing contours.

 $14-18'' \times 48''$  Model C Toolmaker's Lathe—surface cutting speed automatically maintained on facing operations.

 $15-18'' \ge 96''$  Engine Lathe with Keller controls—boring and turning contours simultaneously.

16-Shapemaster with Keller controls-turning a tapered square.



17—Shapemaster with forming device—the lathe that engraves; first showing of the most remarkable development in turning history.

18—20" x 48" Model C Engine Lathe with "AIR-TRACER" turning constantly changing contours, tapers and diameters.

 $19-20\,^{\circ}$ x  $48\,^{\circ}$  Model C Toolmaker's Lathe with "AIR-TRACER" —one cutting tool doing the work of many on multiple-diameter, high-production parts.

20-Magna-Matic - maximum output on work having multiple diameters and necks.

21—20" x 72" Model M Engine Lathe with automatic sizing controls—electronics applied to the turning of long, multiple-diameter shafts having great diameter variation.

22-25" x 48" Model N Engine Lathe—a heavy-duty machine with all the refinements required for high finish and close accuracy.

23—32" x 84" Model NN Engine Lathe with 50 hp drive—from this super high-speed 50 hp machine the chips roll as they never rolled before.



spindle rigidity under heavy cuts without tail center support.

25-13" x 18" Mona-Matic with cam bar and tool relief-highspeed, multiple tool, front and rear carriage turning and necking.

26-13" x 30" Mona-Matic with "AIR-TRACER"-a fully automatic machine with magazine loading.

27-Uni-Matic-two machines in one; a versatile producer of chucking work in quantity.

28-Uni-Matic with "AIR-TRACER"-a continuous, single tool cut on a chamfer, multiple diameters, tapers, radii and shoulders.

29-Uni-Matic with hydraulically-operated table-a novel method of machining a difficult counterbore.

30-13" x 30" Mona-Matic with "AIR-TRACER"-automatically turning or boring continuously increasing or decreasing contours with a single cutting tool.



THE MONARCH MACHINE TOOL CO., Sidney, Ohio

#### Precision-Built BENCH VISES

for Light or Heavy Duty



Outstanding Features of ACME PRECISION VISES EVEN, CENTRAL PULL — the spindle is fitted into a horizontal sleeve nut, eliminating dead motion.

NO SIDE TWIST — Precision Guided Steel Key at base of the main body eliminates wear.

PRACTICALLY INDESTRUCTIBLE — Head and Nut are Malleable Castings; other parts are semisteel castings of high tensile strength.

GROUND JAWS are reversible and interchangeable.



#### Adjustable ANGLE PLATES



PRICE \$16.85 NET Machining and Grinding Angles

These Angle Plates are made of the highest quality gray iron, carefully machined and ground. All steel parts are hardened and ground. The illustrated model has four  $3_{16}^{\prime\prime}$  "T" Slots; when set at 90°, three are on the face side and one on the top.

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ACCURACY YOU CAN TRUST

#### 5-PLUS FEATURES

- 1 Greater accuracy and stability
- 2 Longer wear life
- 3 Less weight
- 4 Positive identification
- 5 Positive adjustment

### ACCEPTED!

#### THREAD RING GAGES

No wonder more and more industries are adopting this gage as standard. Its revolutionary design assures wear life 5 to 7 times longer. And maintains accurate inspection. Just try the Woodworth Thread Ring Gage on your extra tough job—and you, too, will standardize!

Wire or write for folder No. 46R at no obligation.

#### WOODWORTH

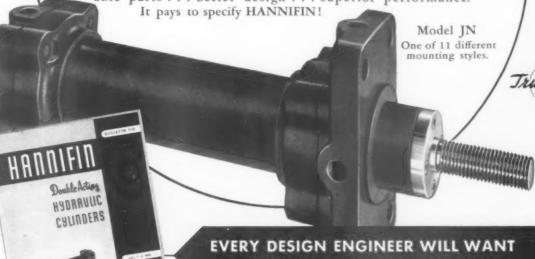
N. A. WOODWORTH CO., SALES DIVISION . 1300 F. NINE MILE ROAD . DETROIT 20, MICHIGAN COMPLETE LINE OF PRECISION GAGES . DIAPHRAGM CHUCKS . CONE-LOK JIGS

# Another SPECIAL" HYDRAULIC CYLINDER!

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It's special because it's built to YOUR specifications! You can have any length stroke you want... a choice of mounting styles to meet your needs... bore diameter to fit the job... standard, double end, or heavy duty (2:1) piston rod... adjustable cushions... inlet ports on any side... air vents wherever needed—all "special" for YOU.

But it's standard with Hannisin because the Hannisin line of hydraulic cylinders is COMPLETE! For users of cylinders, this means lower engineering costs...quicker delivery...completely interchangeable parts...better design...superior performance.



A COPY OF THIS NEW BULLETIN.

It's easy to get the right answer for even the most special jobs when you use Hannifin's new handbook on hydraulic cylinders. 52 pages of helpful specification and engineering data, complete with diagrams and dimensions.

Ask for Bulletin 110-J.

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#### HANNIFIN HYDRAULIC POWER UNIT

Here is an improved hydraulic pressure generator offered by Hannifin in a broad range of sizes. Designed and built for heavy duty service. Capacities to 100 g.p.m. or larger. Choice of pump types—single, double, and combination styles. We will be glad to help you develop circuits and plan controls. See your local Hannifin representative or write.



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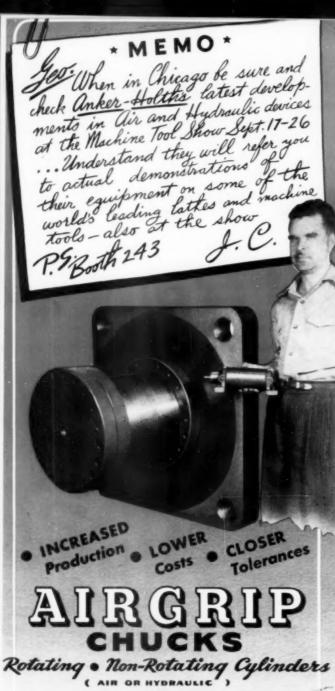
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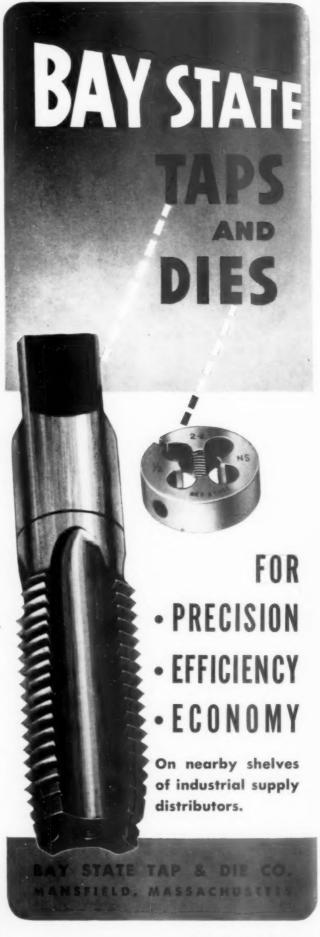
For fast, smooth, dependable power that does the job right, leading machine designers recommend "AIRGRIP CYLINDERS." Extra strong cylinder walls . . . Easy to service ... No manual adjustments ... Used wherever there is a need for controlled pull-push-lift or lowering action.

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Regulating Valves, Air Operated Collets, Arbors, Expanding Mandrels, Adjustable and Compensating Chucks, Lubricator Assemblies, Drill Press Chuck and Cylinder Combinations, Special Chucks and Cylinders.

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The Tool Engineer



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#### E. E. WOOD MACHINERY CO.

2832 EAST GRAND BLVD. DETROIT 11, MICH.

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# FOR TAPPING AND REAMING



It takes less time to make a set-up for tapping and reaming if you use a Ziegler Floating Holder because the set-up does not have to be so accurate, the holder automatically compensating for inaccuracies up to  $\frac{1}{16}$ 2" radius or  $\frac{1}{16}$ 6" diameter.

You will find the Ziegler Holder the solution to the problem of oversize and bell-mouthed holes—and also the solution to the problem of how to cut down rejects.

Try it out and see how much better results you'll get.

#### W. M. ZIEGLER TOOL CO.

1930 Twelfth Street

Detroit 16, Mich.



WRITE FOR CATALOG

for Taps and Reamers ...

#### RUTHMAN GUSHER GOOLANT PUMPS

Photos Courtesy
The Wade Tool Co.
Waltham, Mass.
The Lapointe Machine
Tool Co.
Hudson, Mass.

. . a name to remember when choosing coolant pumps for your machines . .



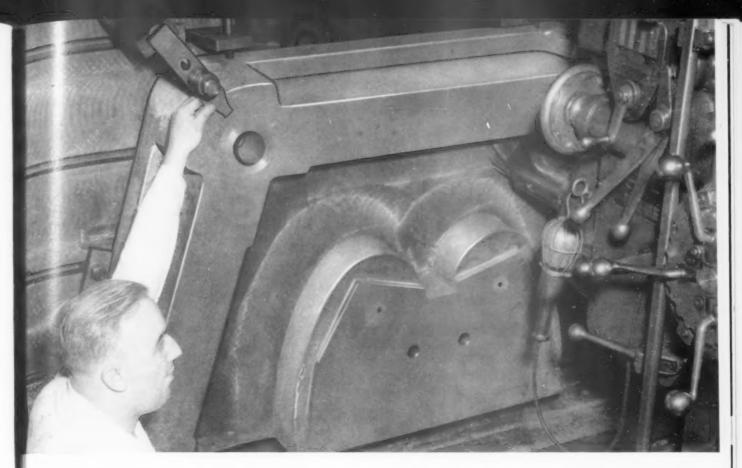
You will find Runman Gusher Coolant Pumps installed on numerous machines at the Machine Tool Show. Leading manufacturers choose Ruthman Pumps for their machines because Ruthman Pumps are of original and superior design, precision manufactured and accurately balanced, and are supplied promptly at reasonable prices. Illustrated above is a "Wade" Model #7 Hand Screw Machine equipmed

Illustrated above is a "Wade" Model #7 Hand Screw Machine equipped with a Model 1-P3 Short 1/10 HP Gusher Coolant Pump in a #1 Tank Unit. Below is a "Lapointe" 18" Special Srv Surface Broaching Machine equipped with a 1/4 HP Model 11020-A Short Gusher Coolant Pump.

Write for Catalog 10-I



1810 Reading Rd. Cincinnati, O.



### Special Die Sets - Ready for mounting the Dies



Mill Die Seats and Recesses

**Drill Mounting** Holes

"Mill die seats and recesses; drill mounting holes; mill mounting pads." The work performed on the set shown here is an example of the machining operations that Danly can do for you while your die set is in process. In many cases this necessary machining can be done on the same setup as standard operations on the die set, thereby minimizing setup and handling time.

Additional machining may be specified on any "special" including M-K and A-S sets which can be ordered directly from the Danly Catalog.

This Danly service is especially valuable on large sets. Milling, drilling and boring operations, so easily handled here may cause difficulty in the die shop or your own tool room where equipment is not specifically suited to large work.

Investigate this time saving and cost cutting service. On your next special die set order consider

Danly's service for those "extra" operations that can be handled here. Your die set will be delivered "ready for mounting the dies."



DANLY MACHINE SPECIALTIES, INC., 2100 So. 52nd Ave., Chicago 50, Ill.

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### DANLY Special DIE SETS

MACHINED TO YOUR SPECIFICATIONS

# Walker-Turner light

BUILT WITH ENGINEERING

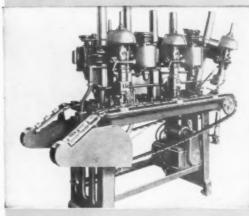
Engineering skills developed through association with industries' problems give Walker-Turner unparalleled know-how-unquestioned leadership-in the manufacture of light-weight, low-horsepower Machine Tools . . . machines that are low in cost, and are solving productioncost problems in thousands of industrial plants.

Walker-Turner Machine Tools insure flexibility of operation: Plants using Walker-Turner Machine Tools are prepared for quick production set-up changes at minimum cost. And in the shop where space is a premium, these machines can be added without disrupting shop layouts.

Walker-Turner Machine Tools Replace Costly Machines: Walker-Turner Machine Tools are performing many operations formerly done on costlier and heavier machines and performing these operations more efficiently at greater production rates and less cost. In replacing heavier and more expensive machines, users have answered the oft-quoted question, "Why use a 10 ton truck to do the work of a 1 ton truck?"

Walker-Turner Machine Tools are low in cost: Because of their wide range of speeds for a wide range of materials . . . because of the versatile work performed, Walker-Turner Machine Tools are profitable investments. They're light but sturdy in construction, built to last a long time. Walker-Turner Machine Tools pay for themselves in a few weeks of operation.



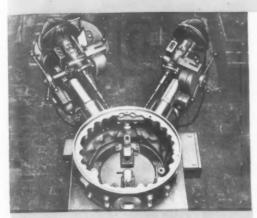


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MACHINE TOOLS

# machine tools.

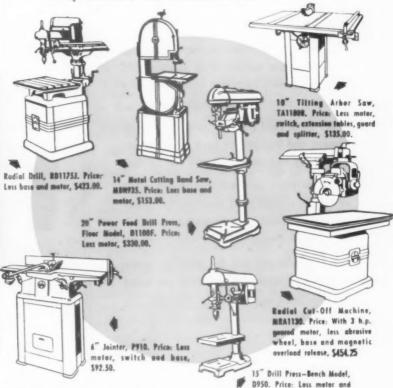
PROVED IN PRODUCTION





In these actual shop applications Walker-Turner Machine Tools are used singly or in batteries with jigs, fixtures and attachments to perform specific jobs. Under continuous operation, they provide uninterrupted performance with trouble-free maintenance, smooth operation, and high rates of production at low cost. -

Send for Walker-Turner's new illustrated booklet "Case Studies". It contains current case histories showing how these and other plants are using Walker-Turner Machine Tools with user-designed jigs, fixtures and special set-ups for increased production. See how a small investment can bring operating flexibility, increased productivity and low maintenance costs.



COMPLETE CATALOG OF WALKER-TURNER MACHINE TOOLS SENT ON REQUEST

DRILL PRESSES - HAND AND POWER FEED . RADIAL DRILLS RADIAL SAWS METAL-CUTTING BAND SAWS . POLISHING LATHES . FLEXIBLE SHAFT MACHINES RADIAL CUT OFF MACHINES FOR METAL . MOTORS . BELT & DISC SURFACERS

belt guard, \$66.50.

#### PRUSSIAN MACHINERY COMPANY INC.

### **ANNOUNCES**

The Change of Corporate Namo to

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Backed by more than 30 years of experience in the Machine Tool Industry, particularly in production equipment, we are qualified to assist in the selection of proper machine tools for any metal-working task.

In many instances we have furnished the equipment tooled for a specific job, with a guaranty as to the production of a specified number of pieces per hour.

We have facilities available for the designing and building of such tools as may be desired with machines.

Not only are we familiar with thousands of types and makes of machine tools, but we have complete knowledge of their operation and application.

Our engineers will be glad to make recommendations and assist in procuring machine tools applicable to any job.

1475 EAST GRAND BOULEVARD TELEPHONE - PLAZA 2611 DETROIT 11, MICHIGAN

#### HERR aids to precision



#### Save Time on Surface Grinder With SCHERR MAGNE-BLOX

When placed on magnetic chuck, these manetism-conducting parallels and angle irowill firmly hold small pieces and irregular shaped work. No need of special clamps will firmly hold small pieces and irregular shaped work. No need of special clamps of the state of the

#### Scherr Cutting Tool Grinding Fixture

FOR SURFACE GRINDER. Grinds both cutting angle and clearance in one setting. The unique patented feature is a tilting block which if tipped, gives 3, 5, 7, 10 degrees clearance to the tool, just the right cutting angle to suit the material to be machined. This simple inexpensive tool does the work of special machines. Clamp the tool to the ground in the Scherr Fixture, set to angle desired and tilt the block to proper clearance. Special introductory price \$27.50, FOB New York, with Scherr money back guarantee.



#### The Little Wonder Radius Dresser

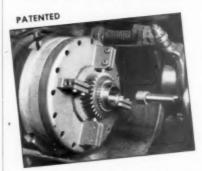


Dresses wheels on surface grinders or cylindrical grinders to any desired radius up to I", concave or convex. The swinging arm, the only moving part of this ingenious simple device, is pivoted on two lapped centers which never freeze or clog. Supported on both ends with no overhang or slides, there can be no ribration of the diamond. Supported on both ends with no overhang or sides, there can be no vibration of the diamond. Result: absolutely smooth and accurate radii on the wheel. The Diamond tool is set by means of Micrometers, Depth Gages or gage blocks. Price complete with 1/3 carat diamond \$46.00—\$39.00 without.

us at the Machine Tool Show-Booth 663

CO., Inc. 199-A LAFAYETTE STREET

#### **DIAPHRAGM CHUCKS**







Look, a high speed, precision chuck with no parts to wear out! Result: Maximum accuracy, minimum maintenance! Because the Woodworth design assures the ultimate in concentric chucking. Obviously, it will solve your precision chucking problems, as it has already for large manufacturers of gears and other production parts. Send your precision chucking problems to us—at no obligation.

MECHANICALLY OR AIR OPERATED

**ACCURACY YOU CAN TRUST** 

#### WOODWORTH

N. A. WOODWORTH CO., . SALES DIVISION 1300 E. NINE MILE ROAD . DETROIT 20, MICHIGAN



Here is a new Kennametal tool that sustains output on mass production jobs, requiring complex tool set-ups.

It comprises a solid Kennametal round, clamped on end in a heat-treated steel holder, and supported by a back-up adjusting screw. Each end of the Kennametal round provides a circular cutting edge. A small section of this edge, depending upon depth of cut, bears against the work. When this section becomes dull, the clamping screw is loosened, and the Kennametal round is revolved around its axis to provide a new cutting edge. The clamping screw is then retightened.

After being thus indexed several times, until all of the cutting edge of one end of the round has become dull, the round is then turned end for end to provide another cycle of cutting. Thus, once the tip is set, it provides a correctly-positioned cutting edge throughout the sequence of indexing of both ends.

When both ends of the Kennametal round have become dull, it is removed from the holder, reground, and thus made ready for another double cutting cycle.

Styles 3RS and 6RS tools are described and priced in Catalog 47. Write for a copy.

The steel cluster gear shown above is a mass production item. Conventional tipped tools limited its output, because of the extensive regrinding involved, periodic adjustment required with a complex set-up, and the necessity for repositioning tools after each regrind.

Solution of this problem was achieved by the use of a distinctive type of tool, utilizing a solid Kennametal round similar to that illustrated and described at the left. The significant fact brought out on this job is the remarkable durability of Kennametal. For example:

Rough turn and face Operation . . . 2,000 gears were machined with both ends of the Kennametal tip before it was reground. The tip was reground on both ends eight times, and machined 16,000 pieces during its life!

Semi-finish Operation—5,600 gears machined with both ends of Kennametal tip before regrinding. Tip was reground on both ends sixteen times, and machined 89,600 pieces!

Finish Operation—3,600 gears machined per double end grind ... 16 regrinds ... 57,600 gears machined during the life of the tip!

The tool and the set-up on this job are unusual—complete details will be furnished on request. The performance of Kennametal is not unusual . . . it has been conclusively demonstrated that Kennametal users may get up to 6 times the output per unit of cemented carbide consumed!

Visit KENNAMETAL EXHIBIT-SPACE 570. MACHINE TOOL SHOW





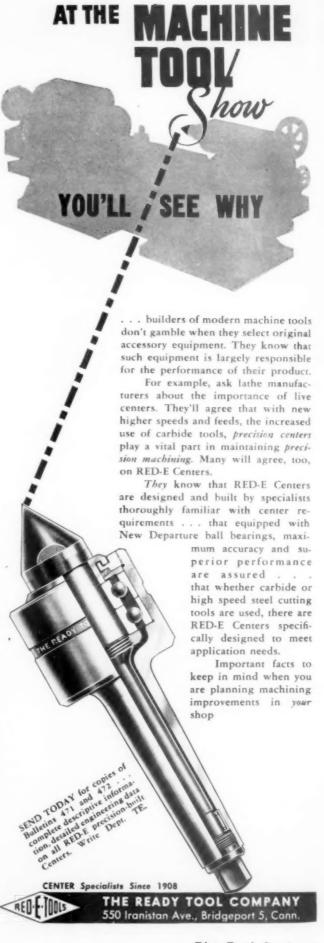
merely a collection of hints, ideas, suggestions and shop short cuts gathered by Woody in his travels among shops all over the country. Their real purpose is to smooth out and step up routine tapping jobs, save time and cut rejects.

Where specific problems come up, definite engineering advice should be obtained. If you will send complete data on the job - material, depth, diameter, lubricant, etc. - our engineers will be glad to make recommendations. No obligation, of

\*Note — Woody Spencer's Tapping Tips are appearing here as often as Woody gets time to write them up. Look for them. Woody Spencer's new Tap Guide is full of handy information that will help in tapping operations. It's free. Write for your copy on the company letterhead.

THE RIGHT TAP AT THE RIGHT TIME

he Wood & Spencer Company Asseland 3. Ohio



# Crowlity Quality

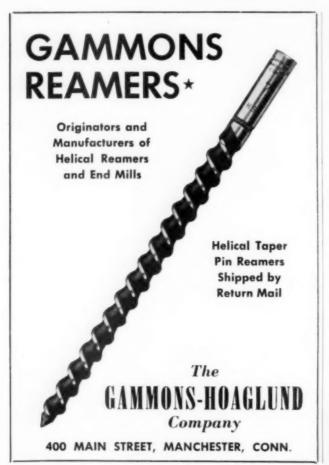
Crobalt is a hard alloy (containing principally chromium, cobalt, tungsten, vanadium, zirconium and carbon), cast in the form of tool bits and inserted milling cutter blades especially developed for high speed production. At high temperatures (up to 2000 degrees) Crobalt cutting qualities remain constant.

The cutting edges of a Crobalt tool stay sharp longer, and thus assure you of much greater tool life between grinds. This automatically increases production by reducing "Down-time" ordinarily required for changing of tools. Try Crobalt in your shop.

#### CARBIDE TIPPED Inserted Milling Cutter Blades

Crobalt now fabricates carbide tipped inserted milling cutter blades. Any make of tungsten carbide can be furnished. Prices for this type of blade are unusually low and the product and finish are unexcelled. We manufacture blades of all types and sizes. Send us your prints for quotation.

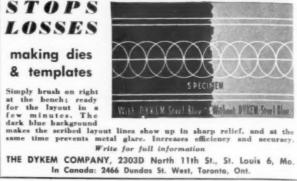
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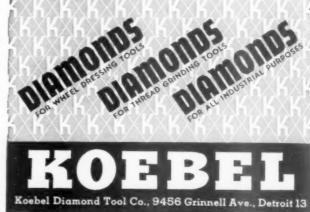


#### DYKEM STEEL BLUE

STOPS LOSSES

making dies & templates





# FOR IMMEDIATE DELIVERY

The new "Standard" Steel Die Sets are now being made on a production line basis and are in stock for prompt shipment. These die sets . . . all parts steel and instantly interchangeable . . . save big money by reducing the time required for setting up dies and making replacements during production runs.

Special design die sets are manufactured and finished with the same quality and precision as the cataloged set sizes. Sketch pads are available for convenience in ordering special sets. Ask for a supply.

Write, wire or telephone for quick delivery.

Catalog DS on request.

#### STANDARD MACHINERY COMPANY

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Branch Warehouses:

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INDIANAPOLIS Standard Die Supply, Inc. 26 E. McCarty St. Riley 5824

MONTREAL Bridge Machinery Co. 768 St. Paul St. W. LAncaster 0148

PHILADELPHIA Fidelity Tool Supply 309 Vine St. CAmden 4-7765 WORCESTER Lindco, Incorporated 1023 Southbridge St. WOrcester 6-4637 MIDVALE SHOCK RESISTING TOOL STEELS

For many years, Midvale Shock Resisting Tool Steels have been helping to solve problems inherent in the application of tools where severe shock conditions are encountered. Among the Midvale Shock Resisting Tool Steels are Midvale Duredge, Midvale Beta Chisel steel, Midvale Salvo rivet set steel, Midvale Multole punch steel, Midvale Va-Cro tool steel and Midvale Non-Tempering tool steel.

Specific catalog information concerning these materials is available upon request or our metallurgical staff will be glad to make suggestions based on your particular requirements.

THE MIDVALE COMPANY . NICETOWN . PHILADELPHIA

OFFICES: NEW YORK . CHICAGO . PITTSBURGH

WASHINGTON . CLEVELAND . SAN FRANCISCO



STAINLESS AND TOOL STEEL BARS

CORROSION AND HEAT RESISTING CASTINGS

FORGINGS AND RINGS

Custom Steel Makers to Industry

MACHINE TOOL SHOW...

# Eleven NORTON MACHINES SINDERS 3 LAPPERS

SEE these very latest developments in grinding and lapping machines in action at the Dodge-Chicago plant.

You'll find that the design keynote for all eleven Norton machines, whether they are for the production line or for the tool room, is CONVENIENCE—

controls and adjustments grouped for easy, convenient operation;

mechanisms easily accessible for convenient maintenance service.

If you can't get to Chicago
let us send complete information
on these new Norton machines —
the latest word in grinding and lapping
— no obligation, of course.

NORTON COMPANY WORCESTER 6, MASS.

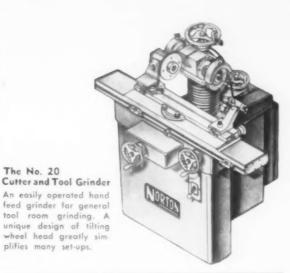
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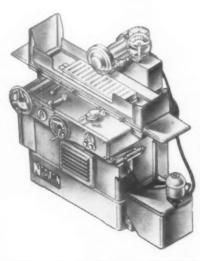


#### The SEAL-O-LAP Lapping Machine

A unique lapper designed to produce an extremely flat "seal" surface with a superior finish on the com-ponent parts of all types of rotary seal devices.

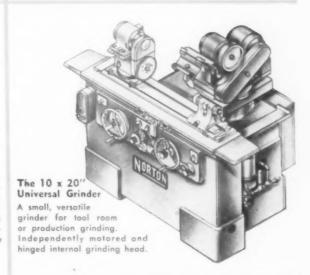
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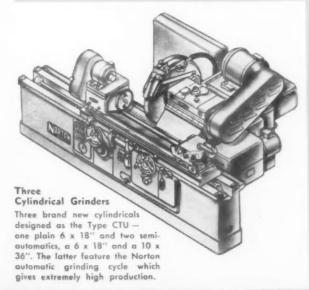


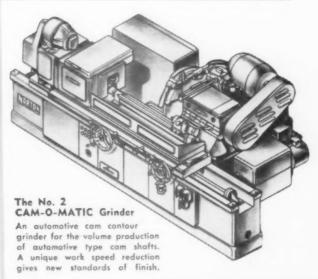


#### The 8 x 24" Surface Grinder

A speedy, high pre-cision hydraulic sur-face grinder that is excellent for production jobs or tool room work — can be ar-ranged for wet or dry grinding.







THE NO. 2 BURA-WAY GRINDER for convex single point tools THE NO. 16 FC LAPPER — a universal machine for flat or cylindrical work THE SIMPLEX SURFACE FINISHING MACHINE for small cylindrical work

IN SPACE 5 at the MACHINE TOOL SHOW

# 32 ALUNDUM GRINDING WHEELS

Faster and Cooler Cutting Longer Life and Fewer Dressings

SEE the new
32 ALUNDUM grinding wheels in action
— not only on Norton machines but
on many grinders throughout the show.

Available in all standard sizes, you'll find them on large cylindrical and surface grinders as well as many small internals.

32 ALUNDUM abrasive is entirely new — made differently by a Norton-invented and Norton-patented process.

Each grain is a single, complete crystal, not crushed to size.

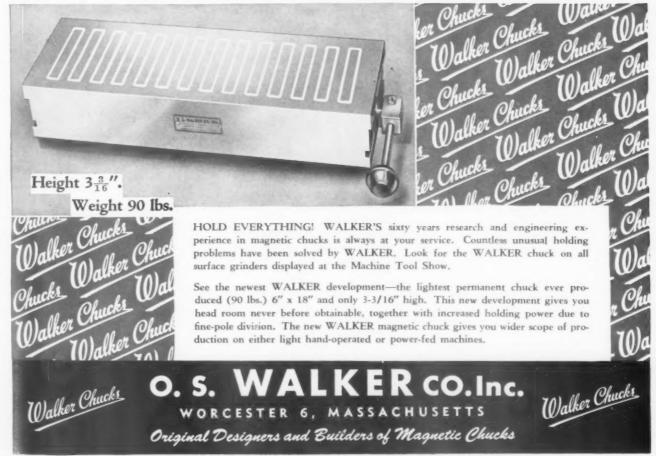
Each grain has many sharp points for faster, cooler cutting.

See for yourself how 32 ALUNDUM wheels can cut your grinding costs.

NORTON COMPANY WORCESTER 6, MASS.

NORTON ABRASIVES





## SHELDON

TRB-S56 precision lathes



## Production Capacity ---comes ready for production

The new TRB-S56 Sheldon Precision Lathes have the speed, stamina and capacity for general production use — 11½" swing, 1¾" hole thru spindle, 1" collet capacity. They will operate safely at high speed and work to the very closest tolerances, for spindle bearings are "Zero Precision" tapered roller bearings, the most accurate obtainable.

They will take a "healthy cut" too, because they have double V-belts to the spindle to assure full power from their 1 h.p. motor at the point of work. They come ready for production—no breaking-in period is required—start earning from the day received.

Write for Catalog of Sheldon and Sheldon-Vernon.







• In manufacture of special tools for maximum production the skill of the tool craftsman is the most essential element.

Andersons, Inc., specializing in precision tools and fixtures, are so manned and equipped as to assure the best in tool design and craftsmanship.

Your inquiries for special tooling are solicited and will receive prompt, efficient service. Let us help you solve your tooling problems.

GAGES, FIXTURES, SPECIAL TOOLS DOVETAIL AND CIRCULAR FORM TOOLS—MILLING CUTTERS—END MILLS—REAMERS

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2325 NELSON STREET . CHICAGO 18, ILLINOIS

#### MUELLER HYDRAULIC PIERCING

UNITS

With Automatic
Hydraulic Stripping

POWER PISTON

INITIAL HOLD-DOWN
PISTON

STRIPPING PISTON

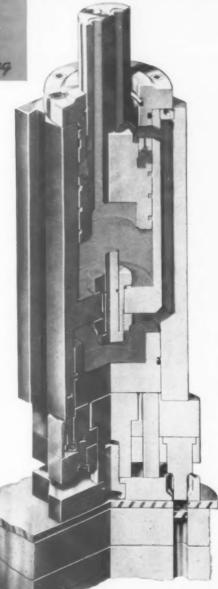
CYL. END PLATE

PUNCH MOUNTING PLATE

STRIPPER

U.S. PATENT No. 2353488 OTHER PATENTS PENDING

**Power Stroke Completed** 



**Stripping Cycle Completed** 

#### A Complete Line of PIERCING UNITS

RANGING IN CAPACITY

5 Tons at 5,000 PSI to 225 Tons at 10,000 PSI

> Maximum Working Pressures

for LIGHT and HEAVY GAUGE METAL PARTS





for Automotive Sidemembers

MUELLER ENGINEERING CO.

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# Q-C Provides the Majority of Units Required for Efficient Tooling Such as—

Retainers and Lo-

• 180° Rectangular In-

cating Pins

Jigs and Fixtures

Vertical Milling

tures & Vises Rest Buttons Cam Shafts

Racks Cams

Rotary Index Tables

Horizontal Milling Fixtures & Vises

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and other units which, by their combination and inclusion, produce efficient iigs and fixtures.

# Detroit 2, Michigan PRODUCTS Q-C ENGINEERING TR inity 1-4400

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To Standardize Is to Economize

Van Keuren 1.68"/DP

#### simplified GEAR MEASURING SYSTEM

is the most accurate and economical method of measuring tooth thickness of external and internal spur gears. Also it may be applied to helical gears.

**◆External Spur Gear** 

#### STANDARD SIZES OF WIRES ARE AVAILABLE FROM STOCK

1.728"/DP for external spurs 1.44"/DP for internal spurs and 30° splines 1.92"/DP for enlarged pinions and 30° splines tentative alternate series

#### ULTIMATE ACCURACY \*

Catalog No. 33 is a manual of precision measuring Caratog No. 33 is a manual or precision measuring systems, giving complete tables and simplied formulas for measuring standard and special threads, splines, spur gears, helical gears and worms. Send for Catalog 33.

Keuren

CO., 174 Waltham St., Watertown, Mass. Light Wave Equipment • Light Wave Micrometers • Gauge Blocks • Taper Insert Plug Gages • Wire Type Plug Gages • Measuring Wires • Thread Measuring Wires • Gaer Measuring System • Shop Triangles • Carboloy Measuring Wires • Carboloy Plug Gages.

#### RMSTR

SETTING - UP

TOOLS



dends as consistently as an investment in ARMSTRONG Setting-Up Tools. These correctly designed, strong and convenient tools cut setting-up time to a minimum. They save machine and man hours day after day and assure rigid set-ups for

accurate work, prevent accidents and reduce spoilage.

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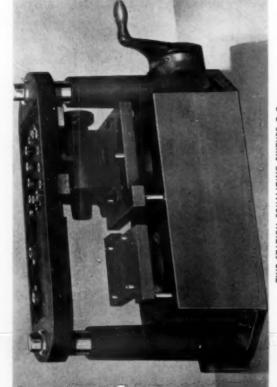
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#### ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

357 N. FRANCISCO AVE. NEW YORK

CHICAGO 12, U. S. A. SAN FRANCISCO



cover plate bolt holes—L. H. Side Drill (4) %". TWO-STATION EQUALIZING FIXTURE Q-C Part-Transmission Case. Operations: R. H. Pase flanges. Part-shown in Fixture).

holes in one part

# New

internal wrenching
self-locking nut by
ALLEN

Comparison of ALLENUT, used with Allen Socket Head Cap Screw, and conventional bolt and nut. Note how internal wrenching principle contributes to designing that saves space and material. Clearance for open end or box type wrenches not required.



#### ALLENUT

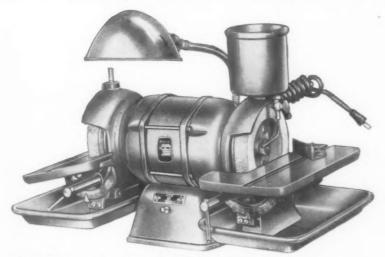
This new internal-wrenching nut holds with a weld-like grip,—self-locking in non-hardened metals. Knurled flutes are drawn down into counterbored hole as screw is tightened in nut. Yet easily removed without damage to nut or containing parts by backing off on screw and tapping screw on head. Using ALLENUTS with Allen Socket Head Cap Screws, the positive internal wrenching action of Allen Hex Keys drives fast, firm set-ups in the harder metals. 12-point (double-hex) Allenut socket gives 30° of wrenching swing — as compared with a normal 60°— to speed up assembly in cramped quarters.

The ALLENUT sets up flush to achieve streamlined surfaces. It facilitates more compact designs with resulting economies in space, weight and material. Adds immensely to the finished appearance of any job... Precision-made of special-alloy steel to Allen standards; threads tapped to a Class 3 fit.

Ask your local Industrial Distributor for samples for test applications. Available only through authorized ALLEN Distributors.

The Allen Mfg. Company \* ALLEN \* Hartford 1, Conn., U. S. A.

#### Special CARBIDE TOOL GRINDER ....



#### QUICKLY and ACCURATELY sharpens Carbide Tools

BALDOR GRINDERS, series 500 (shown above), is the newest development in grinders especially designed and fully equipped for sharpening Carbide Tools quickly and accurately; has sturdy ½ h.p. reversible, ball-bearing motor, 6" Silicon Carbide wheels, adjustable tool-rest tables and water pot. Complete as illustrated and GUARANTEED 2 YEARS against burn-out. Reasonably Prompt Shipment.

BALDOR ELECTRIC CO., 4335 Duncan Ave., St. Louis 10, Mo.

## BALDOR BALL BEARING GRINDERS

In addition to the Carbide Tool Grinder shown and described AT LEFT, BALDOR builds a Complete Line of Bench and Pedestal Grinders with 6" to 12" wheels. BELOW—BALDOR Bench Grinder No. 101. 1½ H.P., ball-bearing motor; 1725 rpm., 10" Aloxite wheels, adjustable tool rests and many other advanced features.

WRITE FOR BULLETIN 321-C illustrating and de scribing the COMPLETE LINE of BALDOR Grinders





Universal joints perform various functions in a wide variety of applications — from heavy duty power transmission to high or low speed light duty installations. Selection of the *right* joint for the job is important.

Either the Curtis Standard — available in 14 sizes, from  $\frac{3}{8}$ " O.D. to 4" O.D., single or double — or the new Curtis Ball-Type in 4 sizes, from  $\frac{1}{2}$ " O.D. to  $1-\frac{1}{4}$ " O.D., will enable you to specify the correct size and strength of joint to secure the most economical and trouble-free installation.

For heavy-duty jobs specify Curtis Standard Joints — made of alloy steel throughout with each part heat treated and ground for maximum strength, long life and accuracy.

For light-duty work specify Curtis Ball-Type Joints — with bronze center ball and steel forks with center pins of heat treated, centerless ground steel.

Select the RIGHT joint for your particular purpose from the data shown below —

Breaking Loads

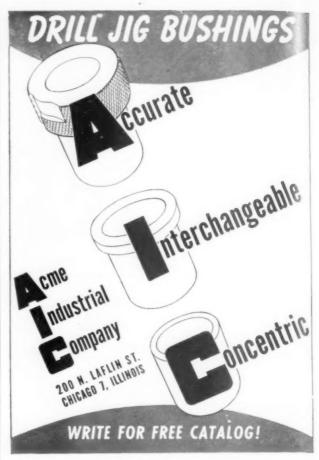
Cat. No.	Туре	O, D.	Overall Length	Static Torque in lbs.	Tensile Load Pounds
C-642	Std.	36"	2"	340	1000
CS-42	Ball	35"	2*	170	720
C-644	Std.	34"	2-11/4"	1300	2800
CS-44	Ball	36"	2-11/4"	650	2000
C-646	Std.	1*	3-3%"	2500	5150
CS-46	Ball	1*	3-3%*	1250	3600
C-648	Std.	134"	3-34"	5000	7200
CS-48	Ball	11/4"	3-34"	2500	4950

All Curtis Joints can be furnished with hubs machined to your specifications.

Drawings should accompany inquiry if possible.

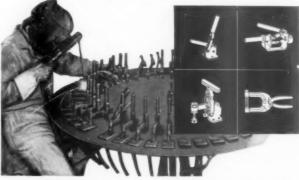
For complete engineering data and drafting templates write Dept. B-2

CURTIS UNIVERSAL
JOINT CO. INC. SPRINGFIELD
MASS



#### SMART TOOLING!

SIMPLE - SURE - FAST - FOOLPROOF



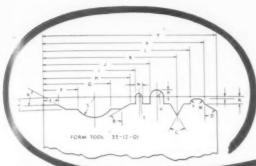
Here's efficient tooling based on the quick action and positive holding power of De-Sta-Co Toggle Clamps. This simple turntable with its 48 No. 210-S clamps enables one welder to keep abreast of two helpers. One places curved shank in socket and unloads finished assemblies. The other locates pierced hole in plate over shank and locks securely with toggle clamp. The expert welder works without interruption.

Smart tooling like this is the backbone of modern mass-production technique. You'll see De-Sta-Co Toggle Clamps playing vital parts wherever the principles of sound tool engineering are observed. Welding production is only one of the many fields for quick acting clamps. For holding parts in milling, drilling, routing, riveting, cementing—for fast, uniform, foolbroof action—progressive tooling demands De-Sta-Co adaptability and quality. There's a De-Sta-Co clamp for every job, designed and built to stand up under the wear and tear of volume production. Send for copy of Catalog No. 47.

DETROIT STAMPING COMPANY

328 Midland Ave.

Detroit 3, Mich.



#### SAVE TIME AND COMPUTATIONS MEASURE TOOL CONTOURS DIRECTLY

## WITH THE BAUSCH & LOMB

#### CONTOUR MEASURING PROJECTOR

T PROJECTS a sharp, distinct, geometrically true, magnified silhouette of the object on a protractor screen where all angular measurements can be read to ±1 minute of arc (1')—an accuracy not attainable with any other projector. Direct linear measurements, reading to ±.0001" may be made by means of the cross slide stage with its attachments.

Dimensions, angles, and profiles of production-run parts can be compared directly with a traced outline of the projected image of the master part, or with a large scale drawing superimposed on the screen. Defects are located quickly and simply.

Write for Catalog D-27. Bausch & Lomb Optical Co., 763-1 St. Paul Street, Rochester 2, New York.



BAUSCH & LOMB



#### GREATER STRENGTH where you want it, with **HOLLOW SET SCREWS!**

Mac-it Hollow Set Screws will solve your toughest holding-down problems where flush surfaces, compact construction and a neat appearance are factors. All Mac-it screws are heat-treated and accurately made with die-cut threads. Whatever your needs, let the complete Mac-it line serve you. Sold through recognized distributors from coast to coast and in Canada.

MAC-IT PARTS COMPANY LANCASTER, PA.

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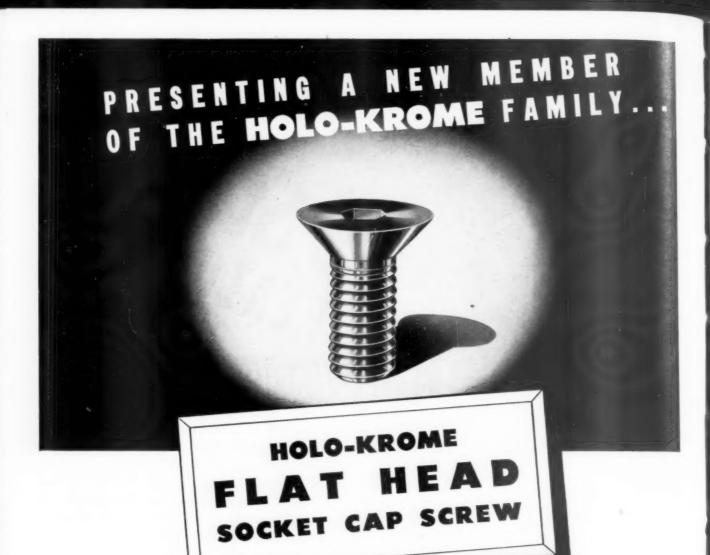


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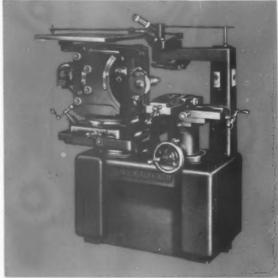
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